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LAYING DURAX PAVEMENT AT THE BROOKLYN NAVY YARD.
The first Durax or Kleinpflaster pavement to be laid in this country.

DURAX PAVEMENT IN THE BROOKLYN NAVY YARD

First Pavement of This Kind to be Laid in the United States—Concrete Foundation Given Very Smooth Surface—Half-Inch Cushion of Chips—Stones Used Are Three-Inch Cubes.

By WALTER H. ALLEN, Civil Engineer, U. S. Navy.

Durax or Kleinpflaster pavements have been in use in England and on the Continent for the last few years, but the first instance of such pavements being laid in the United States is the work now in progress at the United States Navy Yard, Brooklyn, N. Y. The further laying of this pavement by the Government, as well as its use in the city of New York and in other large cities, is dependent largely upon the success of this first venture. Consequently the work is being closely followed by a number of municipal engineers.

A Durax pavement is a stone wearing surface upon a concrete base. The stones are irregular cubes, roughed out by a special machine instead of being laboriously squared by hand. A variation of about $\frac{3}{4}$ of an inch is usually allowed in the dimensions of each stone and the sizes vary from $2\frac{3}{4}$ inches to $3\frac{1}{2}$ inches, according to the preference of the engineer and the stone available. In general, the irregularities of the stones are such as to prohibit close laying in straight courses. On this account, the stones are laid in concentric segments of

circles, advantage being taken of the arch stone shapes of the blocks to secure smaller joints. While the irregularities of the surface of each stone may be large when compared with the size of the stone, they are small as compared with the irregularities of surface of the ordinary paving blocks.

The essential features of a good Durax pavement are a smooth concrete foundation, a thin cushion of gravel or stone chips, a strong, slow wearing stone surface, and a pitch grout that penetrates not only the joints between the blocks, but also the underlying cushion so as to give a surface impermeable to water.

The chief advantages claimed for it are durability, smoothness, and cheapness. The last is secured by roughing out the blocks by machine, utilizing stone too small for getting out paving blocks of the size ordinarily used in this country, and by employing experienced men who can lay the stone quickly.

In the work at the Brooklyn Navy Yard, the blocks furnished by the contractor are of such regularity in size and so nearly cubical that it is unnecessary to lay them in concentric segments; equally tight joints are obtained by laying the blocks in straight rows, and the advantage of distributing wheel loads over several blocks is obtained by laying the blocks oblique to the line of traffic, as well as in laying them in concentric segments.

A grouting pitch of coal tar is used, having a high melting point and poured at a temperature of 300 deg. Fahrenheit. Great care is exercised to have the cushion of trap chips artificially dried and the joints filled with

hot chips. Little ramming into the one-half inch cushion is possible. Particular attention is given to the concrete foundation to secure a smooth surface true to grade. Templates are used in laying the concrete and the surface is smoothed with an iron similar to an asphalt smoother.

This paving in the Navy Yard work is particularly difficult because the site, surrounding a dry dock, is badly cut up with standard railroad tracks, heavy crane tracks, conduits with tops flush with the surface and many manholes. Catch basins are located at frequent intervals between rails and along the margin of the work. These complications considerably increased the bid prices for paving the area. The contract price for the Durax pavement is \$4.10 per square yard. The lowest bid for the work, using granite blocks as specified by the Borough of Manhattan, New York City, was \$3.98 per square yard. The difference in price is easily accounted for by the experimental nature of the Durax pavement and the fact that at the time of opening bids, there was no machine in this country for making the blocks. Doubtless with more familiarity with the manufacture and laying of the blocks, the cost can be appreciably reduced.

The cuts show the methods used in making the concrete foundation and a section of pavement laid in concentric circles and ready for grouting.

Note: The machine used for cutting Durax blocks was described in our issue of April 4, 1912. Reference to this pavement appeared in our issue of February 15, 1912.



LAYING CONCRETE FOUNDATION FOR DURAX.

BITUMINOUS GRAVEL CONCRETE PAVEMENTS

Reasons for Failures of Such Road Surfaces.—Clay Film on Gravel and Poorly Graded Sizes.

By J. W. HOWARD, Consulting Engineer on Pavements and Roads.

Gravel, because sometimes easily obtained or cheaper, has been tried in various ways, for some years, as a substitute for crushed stone as the principal mineral aggregate of bituminous bound road surfaces. The following may be interesting in connection with the paper of similar title by S. J. Stewart in Municipal Journal for Feb. 27 and March 6, 1913. (See also issue of May 29.—Ed.)

The writer has lately been called to investigate the causes of failure of certain new pavements containing gravel and bituminous cement, and to advise a municipality what, if anything, can be done to repair the disintegration and to prevent it occurring in the rest of the pavements to be constructed in 1913. He consulted his field notes and data on bituminous stone mixture pavements, filed during past years, and then inspected various other similar roads and pavements, including the four roads of light traffic described in your publication. Mr. Stewart's paper, while describing the construction during 1911 and 1912, seems to have been too soon after these roads were finished to then draw definite conclusions.

The practical objection to the use of gravel as found in a bank or pit is the lack of uniformity as stored by nature, and the necessity, for the successful construction of bituminous pavement, of actual knowledge by the constructor of the quantities of sizes and properties of the particles of gravel used, together with the qualities of the surfaces of the gravel such as will insure adhesion of the bituminous cements to it. Without this definite information in advance, the successful construction of any bituminous pavement is necessarily a matter of conjecture or chance. A few instances of success or failure with bank gravel in its natural state prove nothing as to the best methods of constructing a uniform and successful pavement or road surface.

If gravel is used for a water-bound road, it will not bind itself together if the hardness of the gravel is such as is good to resist wear. Much more than ten per cent of clay or other water-soluble or equivalent hydro-colloidal material must be added to, or be found in, the natural gravel, to bind such gravel together in ordinary water-bound roads. This clay is found in some so-called conglomerate or cementitious gravel.

But if such water-soluble cementitious clay is present on the gravel, as in the White Plains, Amityville, Easthampton or similar roads, then it remains as a film or layer, coating each particle of gravel, and thus preventing the bituminous cement from coming in contact with and adhering to the gravel. The road constructed with such clay-gravel and bituminous cement occludes or absorbs water from rains. The water penetrates the clay covering of the stones and steadily disintegrates such a pavement or road, aided by frost and the shocks of hoofs and wheels. Auto tires also steadily suck out the finer particles of gravel, and finally some of the larger ones also. This is shown by inspection and tests of parts of the four roads referred to. A piece of such road or pavement, placed in water, in due time disintegrates and falls apart.

There are, however, parts of these four roads which are not of the same composition and construction as other parts referred to above. This is evidently due to irregularity of the gravel sizes. Where gravel has not

enough small sizes to fill the voids, or where, as published, "gravel screenings containing not less than 10 per cent of clay saturated with water" were spread over the bituminous-gravel-layer of the roads, and subsequently was washed away by rain; at such places the upper surface of the road soon becomes pitted, rough and friable.

In Babylon, N. Y., where the clay-gravel, bituminous road was constructed about nine months ago, its surface was covered with a thick carpet of asphalt-cement, which, for a while, will keep water out of the pavement below. This carpet is so soft in hot weather as to stick to clothes and shoes of pedestrians, wheels, tires, etc., and is objectionable and disagreeable. At some places this bituminous carpet has been forced into the mineral aggregate below, thus providing an excess of bitumen, causing the entire road surface-layer to be displaced by traffic and form into humps and hollows. Other parts of these roads are composed of gravel so graded as to be similar to the gradation of some gravel-bituminous roads in other states, made of special, selected, graded mixtures of gravel, sand, etc. The result in these parts is that the voids in the mineral aggregate (excluding the bitumen as shown by analyses), are reduced to the low minimum of 11 per cent. The bituminous cement coats the gravel, etc., and fills these small amounts of voids. The result is a dense, water-excluding mass (except for the clay on the gravel) compressed firmly together by the heavy roller used.



BITUMINOUS GRAVEL ROAD, WHITE PLAINS.
Showing results of lack of uniformity of natural gravel used.

Other reasons why bituminous gravel roads fail and some succeed, in various parts of the United States, are worthy of note. Where poorly graded sizes have been used, voids or pockets are formed; even though some sand, etc., is mixed with the gravel. Rain and the elements of weather, the worst enemies of roads, cause water to enter these voids and disintegrate the roads, aided by freezing and expanding. The weather, and especially contraction in cold weather, causes many minute cracks; and traffic disengages the gravel and ravels the road surface. Other failures occur when too large sizes of gravel are used, where stones are of greater or almost as great diameter as the thickness of the wearing surface. The same difficulties in general are experienced with gravel for portland cement concrete as with bituminous cement concrete. Clayey, earthy matter, etc., interferes with adhesion of either portland cement or bituminous cement. If the surface of a gravel is too smooth and polished, although clean, portland and bituminous cements sometimes fail to adhere.

The bituminous gravel concrete roads or pavements which have succeeded in a few parts of the U. S. are those containing very hard and durable gravel, having surfaces to which bitumen can adhere, and of such expressly graded sizes that such gravel can be combined

with some sand and suitable finer filler to make a dense mineral mass with a low percent of voids. Then the whole mass is well coated and mixed with good waterproof asphalt road cements.

Sometimes it is possible to use hard crushed stone and some carefully selected hard, fine gravel, sand, etc., mixed to form the mineral aggregate for a good bituminous stone-gravel concrete road construction, made by the mixing method and firmly compressed on a durable foundation.

AUTOMOBILES AND MACADAM MAINTENANCE

Effect of Automobile Traffic on the Cost of Maintaining Macadam Roads.—Figures from Actual Experience in a Massachusetts City.

By CHAS. F. LAWTON, Supt. of Streets, New Bedford, Mass.

In discussing the question of the increased cost of maintaining macadam roads, due to the automobile traffic, it is remarkable that no accurate measure of this increased cost appears as yet to have been presented. It is acknowledged that the entire matter of road maintenance is now determined by conditions entirely different from those existing a few years ago.

While automobile development was in its infancy, say ten years ago, the effect on roads was negligible. But in the last five years the tremendous increase of auto travel has presented an entirely new problem to road builders that is of greatest importance. A mere expression of this fact is about all one hears on the subject.

The writer believes that he has, from the records of his own work, a fairly accurate measure of this increased cost. He has had charge of the Highway Department of a Massachusetts city for the past eighteen years, so that the changed conditions noted above have come directly under his notice and supervision.

As the great development of auto traffic has taken place in the last five years, a comparison of the increased cost of maintenance during that period with the previous five years would seem to be a fair measure of auto effect.

This city has always built its own roads and now operates four stone crushing plants, buying stone delivered at the crushers. It has always had the reputation of not only building good roads, but what is really of more importance, keeping them in good repair. The material at hand for building these roads is not of the best, but has certain good qualities that help materially to offset the poor ones. The stone used has been almost entirely weather worn granite from old stone walls, or surface boulders gathered from the fields by farmers. Scarcely any ledge stone has been available. There is no trap in this section of the state and the stone is very friable and easily crushed, and wears rapidly under traffic. In crushing, the percentage of screenings is nearly one-third.

There is a large ingredient of feldspar in most of the stone, and the fine silicate of alumina obtained in the wear of the road surface mixed with the fine particles of the quartz ingredient, makes a natural cementing compound that binds our roads very firmly and makes the surface waterproof.

This fact, however, of our roads being waterproof, combined with the fact of the road metal being easily pulverized, has made our roads extremely dusty until the advent of the use of oil, which has become general in the past five years.

The following table gives, in the opinion of the wri-

ter, the necessary data to formulate a fairly accurate measure of increased wear due to auto traffic in a city where all the improved streets, except the main business thoroughfares, are built of macadam:

Year.	Total sq yds. macadam.	Sq. yds. rebuilt.	Per cent rebuilt.	
1903	784,224	37,403	4.77	Average for 5 years 2.62 per cent.
1904	812,409	30,724	3.78	
1905	813,396	
1906	832,923	28,005	3.36	
1907	852,624	10,229	1.20	
1908	879,944	82,332	9.36	Average for 5 years 6.50 per cent.
1909	940,443	51,323	5.46	
1910	1,029,784	39,049	3.79	
1911	1,085,663	70,798	6.52	
1912	1,168,963	86,060	7.36	

Average total amount of macadam for the first 5-year period, 819,115 sq. yds.

Average total amount of macadam for the second 5-year period, 1,020,959 sq. yds.

Increase of average total, 25 per cent. Increase of average per cent. maintained, 148 per cent.

This table shows that while the average increase in total yardage of the second five-year period over the first was 25 per cent., the average increase in the percentage rebuilt was 148 per cent., or practically six times as much.

It should be mentioned here that this city began the oiling of its macadam streets in 1908, and every year since a complete oiling of all the macadam has taken place. So it may be noted that the increase of 145 per cent in repair work has been exactly coincident with the period of oiling—of course, it is fully conceded that the oiling of macadam roads lengthens their life. But the oiling which lengthens the life of the road and the auto traffic which shortens it, having come coincidentally we find it absolutely impossible to exactly measure either effect by itself.

We can only say that the destructive force of the auto has, in spite of the benefits of oiling, increased the maintenance charges of macadam roads in the ratio of about 6 to 1. In any event the problem is up to the road builder. The solution in my opinion is not determined by putting a heavy tax on automobiles, but by building roads to meet the present day conditions.

RECORDS OF WATER WORKS APPURTENANCES.

Many water departments have experienced the disadvantages of not keeping full and accurate records of the location of mains, valves, etc., but the experience of San Diego, Cal., early in 1912 would seem to have approached the limit. The experience referred to is described by Superintendent Fay in his report for 1912, as follows: "For years the water department had been practically under the control of a few men who for their own personal advantage did not keep reliable public records of the locations of the gate valves of the system, and such maps as were at hand were not authentic and in many instances were incorrect and misleading. In the past, whenever an employee of the department not acceptable to the select few endeavored to learn the locations of valves not recorded, he would shortly be discharged or laid off.

"In endeavoring to accumulate the data regarding this system for the purpose of recording the same as public property in the interest of public safety and in justice to all, I was met with opposition that eventually resulted in a strike by a few who believed they could intimidate me and continue in their heretofore uninterrupted control of

the department." Mr. Fay immediately discharged all of the strikers and filled their places as best he could, being annoyed for weeks after in all of the ways which would suggest themselves to the discharged employees.

"Today," says he in conclusion, "there are 24 books in existence and distributed in the department showing where every gate valve in the system is located, its size, and how it operates; 24 books showing where every fire hydrant is located. There are now four complete sets of wall maps showing every water main in the system, their location and size, and all gates, fittings, hydrants, etc., and there is completed a loose-leaf system of records, to be kept in the vaults at the City Hall, that even shows where the services are located, the meter data and all the additional information required in addition to that given upon the maps and other books issued for the convenience of the employees and the public."

AIR LIFT PUMPING AT HOUSTON.

The city of Houston, Texas, is using about forty wells for furnishing its water supply, and all of these are now operated by air lifts. The first wells were sunk in 1888, and by 1899, 31 wells had been sunk, all used without the air lift. In that year, 13 of the wells were piped with air, and the others were modified in the same way in succeeding years, practically all of those drilled since 1899 having been provided at the same time with air lifts.

In applying the air lift, the central water pipe was lowered to a depth of from 123 to 128 feet, except in one case where it reached 183 feet; while the air pipe was lowered to 120 feet in all but two cases where the depth was 2 feet greater. The central water pipe varied in diameter from 3½ inches to 8 inches, depending upon the size of the well. The air pipe varied from 1 inch to 2 inches, being 1¼ inches in most cases.

In about half of the wells sunk in 1899 and all of those since that time, no central water pipe was used, and the air pipe was increased to a diameter of 1¼ to 5 inches, the majority being 3, 3½ or 4 inches.

Before air was applied, these wells varied in discharge from 28,800 gallons per day to 724,800 gallons; while after the addition of air the flow of the former of these was increased to 159,840 gallons, and the flow of the latter to 1,123,200 gallons. Air was applied to the former in November, 1900, and about a year ago the well had ceased to flow altogether either with or without the use of the air lift. The latter well was finished in January, 1905, when it delivered 724,800 gallons. The air lift was added in January, 1907, which increased the flow to 1,123,200; but five years later, the flow without the air lift was found to be only 90,000 gallons, and with the air lift 985,000 gallons. The average of all of the wells supplied with air lifts was as follows: Natural flow before air was applied, 169,770 gallons; flow with air lift when first applied, 507,879 gallons; flow in January, 1912, without air,

57,257 gallons; flow in January, 1912, with air, 316,118 gallons.

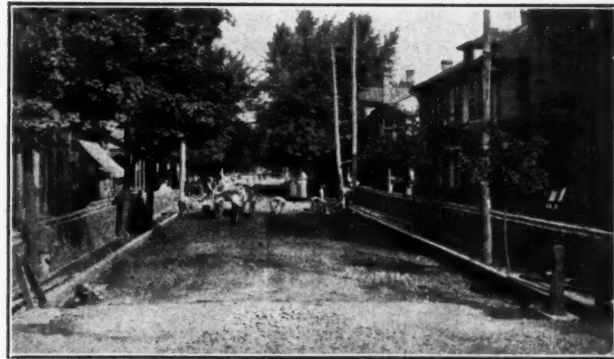
It is seen by the above figures that when the wells were new, the use of the air lift increased the flow on the average nearly three times. At the time J. B. Williams, superintendent of the department, prepared the report from which this information is taken, the wells then in use averaged twelve years old, and the flow without air averaged a little over one-third as great as when the wells were first put into service, and about 54 per cent as much water could be obtained by the air lift as was obtained when the air was first applied to the wells. Also it was found that the flow obtained by the air lift at the time of the report was about five and a half times as great as the flow without air at that time, 17 of the wells showing no flow whatever without the use of air.

BRICK PAVING COST DATA.

By C. A. BINGHAM, C. E.

During the past season the borough of Newport, Pa., contracted for the paving and curbing of North Second street and the following cost data were secured by G. C. Brehm, who was inspector for the writer.

Nothing unusual was encountered in the construction except in the tearing up of the original surface of macadam. To all appearances the street was simply an old macadam street worn down even to the clay in some portions; but upon tearing it up with a roter it was found to contain an immense amount of large rock which nat-



BRICK PAVING AT NEWPORT, PA.

urally tore the subgrade to such an extent that it required considerable filling and rolling to give a proper foundation for the concrete. This accounts for the high cost of the excavation item.

The filler cost was also high because of the cold weather which was experienced while this part of the work was being done. The bricks were not only cold, but the asphalt was chilled considerably in carrying from the kettle and also in pouring from the carrying cans to the special pouring utensils. However, no bad effects to the quality of the work have shown up to present date.

COST OF LABOR AND MATERIALS FOR CONSTRUCTING BRICK PAVEMENT.

Items.	Excavation		Curb		Placing forms.		Concrete.		Foundation.		Sand cushion.		Laying brick.		Asphalt filler.		Miscellaneous.	
	Hrs.	Cost.	Hrs.	Cost.	Hrs.	Cost.	Hrs.	Cost.	Hrs.	Cost.	Hrs.	Cost.	Hrs.	Cost.	Hrs.	Cost.	Hrs.	Cost.
Foreman	40	\$10.00	97	\$29.95	6	\$2.10	89	\$31.15	50	\$12.50	20	\$5.00	38	\$9.50	90	\$22.50	80	\$20.00
Labor	313	46.95	135	110.25	127	23.91	241	44.57	511	89.43	137	23.29	273	47.78	703	123.03		
Team	150	88.75	119	31.10												2.45		
Cement							38*	38.00	112*	112.00								
Sand							16†	15.50	96†	96.00	112†	112.00						
Stone							31†	43.79	191†	267.40								
Asphalt															7¼†	166.75		
Brick													61,000	1,281.00				
Miscellaneous		\$91.13		\$10.00		\$75.25		\$1.30		\$4.00				\$55.50				
Amount	515	cu. yds.	515	cu. yds.	801	ft.	801	ft.	1,430	yds.	1,430	yds.	1,430	yds.	1,430	yds.		
Total cost		\$236.83		\$181.30		\$101.26		\$174.31		\$581.23		\$140.29		\$1,393.78		\$314.73		\$266.60
Cost per sq. yd.		\$0.166		\$0.127					\$0.406		\$0.098		\$0.975		\$0.22		\$0.186	

*Barrels. †Cubic yards. ‡Tons.

The miscellaneous items included \$91.13, removing curb; roller, \$10; lumber, \$72.25; tar paper, \$1.30; coal, \$4.00; hauling brick, \$55.50; freight, \$46.00; office, \$16.00; fares, \$44.60; expenses, \$84.00; supervision, \$56.00.

These cost data are on one block covering 1,430 square yards of paving and 801 lineal feet of 6x18-inch concrete curbing.

The blocks were of shale and of standard size, the foundation was 4 inches of 1:2½:5 Portland concrete with a 2-inch sand cushion properly screened and rolled with a 500-pound hand roller before laying bricks. Asphalt filler was used on the entire area of the street, with no extra width of joint at the curbs.

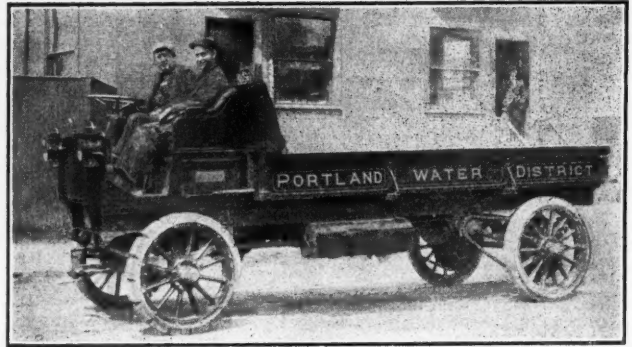
The contractor was W. F. Martin, of Harrisburg, Pa.

PORTLAND WATER WORKS.

Since the trustees of the Portland, Maine, water district took over the plant of the Portland Water Company, they have endeavored to secure and insure greater purity of the supply by all practicable methods. They have condemned all the lake shore property within a mile and a half on either side of the intake (the supply is obtained from Sebago lake) and have removed every possible source of pollution from this territory. Watchmen patrol the shore continually to prevent camping parties or any visitors, and inspectors are constantly on the watch to see that the Maine Central Railroad, whose tracks pass near the lake, do not permit the toilets in the cars to be used while within a certain distance of the lake.

The trustees maintain a laboratory in the building occupied by the water district offices, which was placed in operation on February 13 of this year under the general supervision of James M. Caird of Troy. Since that time an average of more than ten samples a day have been tested. The chemist in direct charge, A. E. Clark, each day collects three samples of water from different localities, and examines them for bacteria, using gelatin and agar plates, making presumptive tests for B. Coli; five tests being made of each of these three samples. At no time since the beginning of taking the tests have B. Coli been shown to be present. The general bacteria count has averaged about 80.

Although the water at present appears to be perfectly



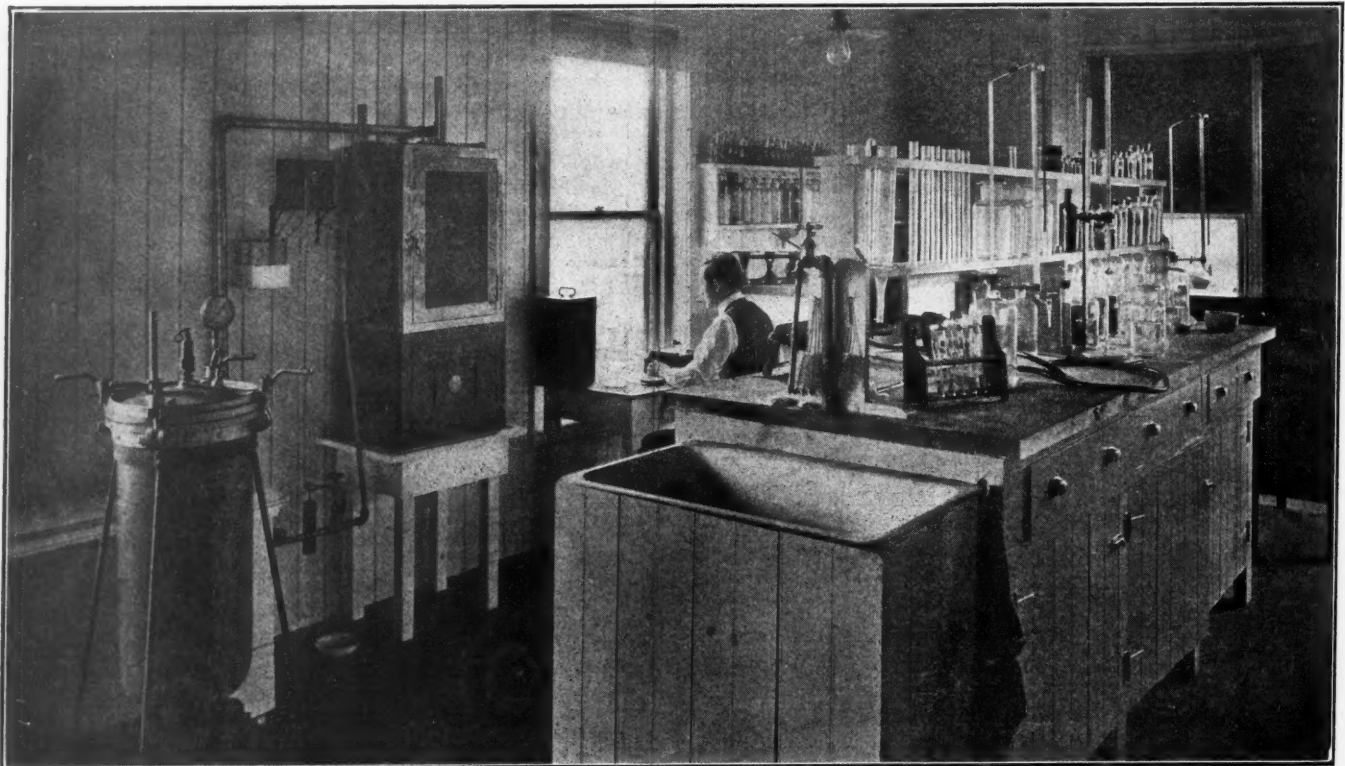
WATER DEPARTMENT TRUCK.

safe, the trustees desire to provide against any contingency, and Mr. Caird is working on a plan to treat the water of the brook which runs through Sebago village and discharges into the lake, which is one of the most probable sources of possible pollution.

In the same building as the laboratory there is a meter testing room and repair shop for repairing meters and other appliances of the department; also a store-room for surplus meters, small pipes, fittings, etc. Another indication of the progressiveness of the trustees is their use of an auto truck for transporting pipe and other heavy materials.

HARRISBURG WATER WORKS NOTES.

During the year 1912 a standpipe at the pumping station of the Harrisburg, Pa., water works, which had been used for equalizing pressure and was in need of repair, was modified in an unusual way, and made to serve as an air chamber for the pumping engines. A manhole was put in the standpipe 10 feet 9 inches from the bottom, and a steel head or diaphragm was riveted several feet above the bottom of the standpipe. The bottom of the standpipe was connected with the discharge pipes of the two old pumping engines and thus was used as an air chamber for equalizing the pressure.



LABORATORY OF PORTLAND WATER DISTRICT.

The upper part of the standpipe would have needed repairing if allowed to stand, and to save the expense of this it was decided to remove it, which was done by men employed by the department by the day. A hole was cut in the brick work which surrounded the tower and in the iron of the tower a short distance above the platform, through which hole a chute extended to the inside of the tower, to which the bricks and iron were lowered by buckets as they were removed from the top of the tower. The bricks were cleaned for future use, the bats and refuse were used for filling, and the iron sheets were sold at \$15 a ton and the cast-iron steps for \$13.80 per ton.

"The removal of this standpipe will save money, as it will not have to be maintained, and the department will not be annoyed in winter time by having to thaw out the ice at the top of the pipe by running a steam line up to that point. An ornamental top will be put on the end of the pipe when it is finished, and provisions made to have the handsome ivy now there extended to that point."

The good work of the filtration plant was continued during the year 1912 and past accomplishments somewhat improved upon. As usual, all turbidity and color were removed, and the average reduction of bacteria for the year was 99.97 per cent., an increase of .03 per cent. over the years 1910 and 1911. The work done by the hypochlorite which is applied to the water in the intake well and by the four million gallon sedimentation basin is shown by the bacterial reduction of 99.36 per cent., leaving an average of 34 bacteria per c. c. in the water which goes to the filter. This small number to be removed by the filters makes possible more regular results by them and has practically eliminated the lost head experienced before the use of hypochlorite.

The operating expenses of filtering the 3,303 million gallons during the year averaged \$5.53 per million gallons, the coagulant costing \$1.35; coal, 36 cents; supplies, 42 cents; repairs, 52 cents; oil and waste, 5 cents; chemist and laboratory, 37 cents, and salaries, \$2.46. The fixed charges for interest, sinking fund and state tax on the filtration loan amounted to \$6.94 per million gallons, giving a total cost per million gallons of \$12.47.

PAVING EARTHWORK COMPUTATIONS

Diagrams Used for Computing Volume of Excavation for Street Paving, Using Various Forms of Field Notes.

By F. C. SNOW, Ass't Professor of Civil Engineering, Montana State College.

The use of diagrams for computing volumes is by no means new, but their application to paving excavation is in all probability not very common and for that reason the following is offered.

There are in general three ways of taking notes in the field which are later reduced in the office and the volumes figured. Each of these methods will be discussed separately.

1st Case.—When the field notes are taken by determining the cuts at points which are equal distances apart and on a line which is at right angles to the center line of the street, as shown in Fig. 2. The area of the section shown by hatching in Fig. 2 equals

$$\left(\frac{a+b}{2} + \frac{b+d}{2} + \frac{d+e}{2} + \frac{e+f}{2} + \frac{f+g}{2} \right) \frac{W}{N} - \frac{2CW}{3}$$

$$= \frac{W}{N} \left(\frac{a+g}{2} + b + d + e + f \right) - \frac{2CW}{3}$$

Note: $\frac{2CW}{3}$ equals the area between a parabola and a straight line at right angles to its axis and C distance from the origin, the line being W long.

If A_1 equals the area at Station 1 and A_2 the area at

Station 2 then the volume between these two stations equals $\left(\frac{A_1 + A_2}{2} \right) \frac{1}{27}$ equals $\frac{A_1 1}{2 \times 27} + \frac{A_2 1}{2 \times 27}$

or if either part of the last member of this equation is considered a partial volume corresponding to the station whose sectional area is A, then

Part. Vol. equals $\frac{A 1}{2 \times 27}$ and substituting the value of A

Part. Vol.

$$\left\{ \left(\frac{a+g}{2} + b + d + e + f \right) \frac{W}{N} - \frac{2CW}{3} \right\} \frac{1}{27 \times 2}$$

$$= \frac{1W}{27} \left(\frac{M}{2N} - \frac{C}{3} \right) \text{ where}$$

M equals $\frac{a+g}{2} + b + d + e + f$ for the section shown in

Fig. 2 or equals one-half the sum of the extreme side cuts plus the sum of all the intermediate cuts for any section. The cuts in all cases are figured from the surface of the road to a straight line connecting the points of intersection of the subgrade line with the curb lines. For example if the elevation of the top of the curb is 100.00, the depth of the gutter 0.5 ft., and the depth of the pavement 1.0 ft., the elevation of the subgrade at the curb is $100.00 - (1.0 + 0.5) = 98.5$, and if the surface elevations at the points from left to right are respectively 100.3, 100.5, 99.8, 99.6, 100.4, 100.2, then

$$a = 100.3 - 98.5 = 1.8 \text{ ft.}$$

$$b = 100.5 - 98.5 = 2.0$$

$$d = 99.8 - 98.5 = 1.3$$

$$e = 99.6 - 98.5 = 1.1$$

$$f = 100.4 - 98.5 = 1.9$$

$$g = 100.2 - 98.5 = 1.7$$

W equals the width of the pavement in feet, N equals the number of divisions into which this width is divided, 1 equals the distance between stations, in feet, C equals the crown of the pavement in feet. Fig. 5 shows a method of drawing a diagram for obtaining these partial volumes, using the values of M as arguments. These values are plotted as ordinates and the values of the partial volumes as abscissas. The horizontal distance from

the origin to the diagonal line is $\frac{1W}{27} \left(\frac{5}{N} - \frac{C}{3} \right)$

when M equals 10.0 and $\frac{1W}{27} \left(\frac{10}{N} - \frac{C}{3} \right)$

when M equals 20.0.

The vertical distance from the origin to the same line is $2CN$

— when the partial volume is zero.

3

M in the above example equals $\frac{1.8+1.7}{2} + 2.0 + 1.3 + 1.1$

+ 1.9 = 8.0, and from the example of the diagram under Fig. 5, when 1, or the distance between stations, equals 50.0 feet, W, or the width of the pavement, equals 30.0 ft., C, or the crown of the pavement, equals 0.6 ft., and the width is divided into five equal parts, or N equals 5, the partial volume is found to be 33.3 cu. yds. when M equals 8.0.

If the partial volumes for a series of stations are as follows:

Station 1.....part. vol. 8.6

Station 1+50.....part. vol. 7.1

Station 2.....part. vol. 7.2

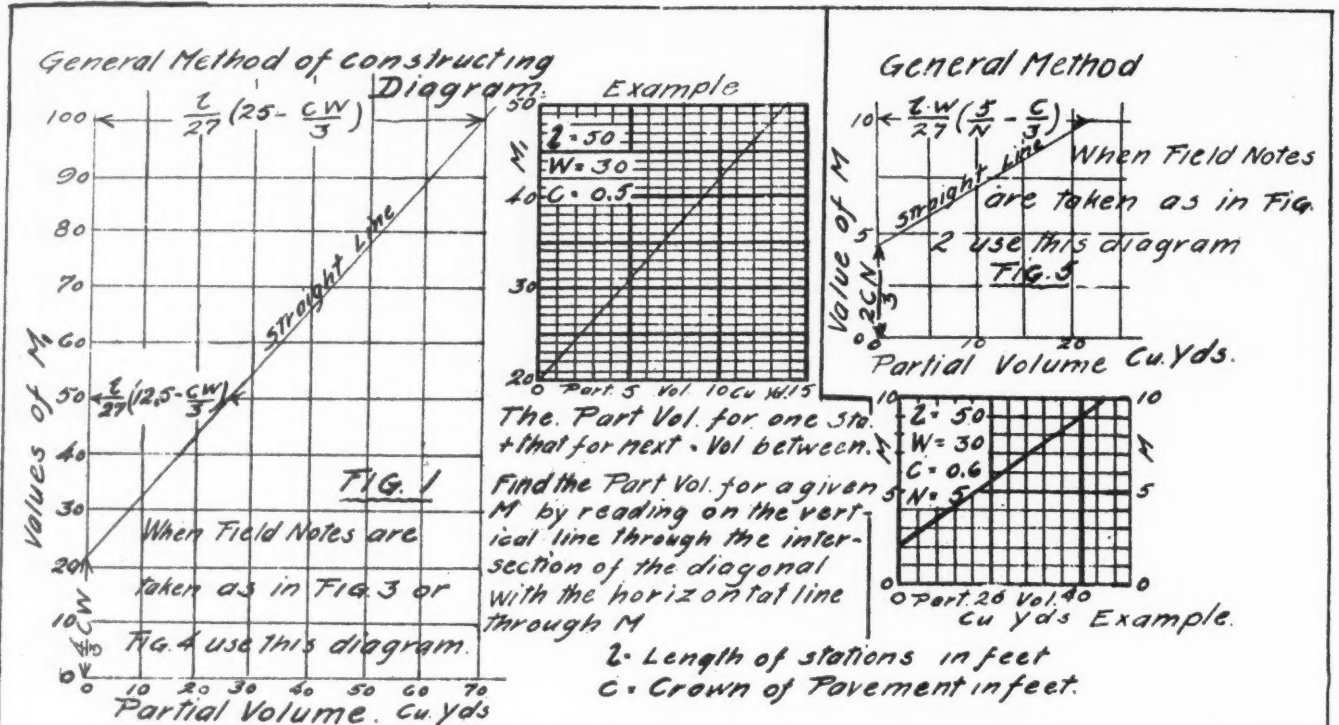
Station 2+50.....part. vol. 6.5

the total volume in cubic yards from Station 1 to Station 2+50 equals $8.6+6.5+(7.1+7.2)2$, equals 43.7 cu. yds., or the total volume is obtained by adding to the sum of the two partial volumes for the extreme end sections twice the sum of all the intermediate partial volumes,

provided the distance between stations, or 1, remains constant.

If 1 equals 50 and the partial volume as picked from the diagram for Sta. 6 is 9.3 and for Sta. 6+35 is 5.2,

(Continued on page 858.)



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S. W. HUME, President
J. T. MORRIS, Manager A. PRESCOTT FOLWELL, Secretary
A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for. Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

JUNE 19, 1913.

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A. W. W. A. Question Box.

One of the most practical arguments in favor of a society like the American Water Works Association is the opportunity which it should offer for an exchange of experiences, by which each member may benefit by the knowledge and experience of all the others. By the reading of papers, each member presumably gives to a society information which he has acquired and which he thinks will be of service to the other members, but it would seem as though a greater benefit would really be obtained if the individual members should ask for the information which they desire and obtain in response thereto the combined knowledge on the subject of the society's membership. The American Water Works Association has for several years endeavored to meet this desideratum by its "question box." Members submit to the secretary subjects which they desire discussed or questions which they desire to have answered, and these in turn are submitted to the members sometime before the annual convention, with the request that they come prepared to reply at the convention, or send replies by mail to be read there. The practical nature of these questions is exemplified by those which have just been received for next week's convention. These deal with the mechanical cleaning of water mains, both methods and results; the use of the standard system of accounts adopted by the association; maintenance of

meters owned by consumers; testing check valves on private fire services; experience with various materials for service pipes; ownership of services from main to curb, with various questions arising when such ownership is vested in the consumer; liability for damage caused by burst mains, damage to hot water boilers from shutting off water, etc.; testing water mains in the trench after laying; supplying water for motors, elevators, etc.; use of quick repair sleeves and pressure recording gauges, and packing street gate valves.

For some reason or other, this question box has not proved to be nearly so useful in the past as it would seem it should have been. The exact reason for this it is difficult to explain, except on the principle that few of the members are willing to take the trouble to answer these questions when the credit which they obtain is so much less than that accorded to the writer of a paper. Possibly another reason is that sufficient effort has not been made at the convention to bring out the replies. We realize that it is very discouraging, when a certain session of the convention is set aside for discussion of the question box, to have the reading of the several questions result merely in silence from the few auditors present; and that it is but natural, after one or two such experiences, for those preparing the program to allot to the question box a few minutes at the end of a session already crowded, with the probability that the subject will not be reached in that session at all but will be postponed until a later one—possibly the final session when only the faithful few are in attendance.

And yet we feel that the idea is such a good one that it is a pity it should not be developed into the most valuable feature of the convention. We hope that those members of this association who attend the convention will do their best this year to see that discussion of the question box is held and brings out some part at least of the valuable information possessed by the members; and that those who do not attend will send to the secretary at once, to his address at the West Hotel, Minneapolis, Minn., any information which they have available in reply to the questions asked. No one can tell when he himself may be in a position to derive great benefit from the answering of some question by the members of the association, and he should earn the right to expect such information by himself doing what he can towards replying to the present queries of other members seeking information through the question box.

Forestry by Water Boards.

One of the matters which appears to be receiving more attention during recent years than formerly is the protection of trees upon the water sheds of public water works, and the planting of new trees on those which have been more or less denuded. Among the items which we have noticed in last year's water works reports are the following:

The trustees of the Augusta, Maine, water district last year bought and planted 55,595 white pine trees around the reservoir, with a view to protecting the water as well as the water shed.

The water board of New Bedford, Mass., following a disastrous fire in 1911, authorized F. W. Rane, state forester, to prepare a forestry map and a working plan to extend over a term of years. Mr. Rane reported upon the same and his report was printed in pamphlet form and distributed to members of the city government and taxpayers. Following this, good progress was made during the year 1912 in the work of authorized development, even more being done than was outlined by Mr. Rane for that year. Thirty thousand white pine and Norway

spruce seedlings were planted; about seven acres of land that had been burned over were planted with white pine trees from six to eight years old. A nursery of eight large beds was established near one of the pumping stations which will furnish fully 30,000 transplants of white pine and arborvitae for this year's work.

The superintendent of the Concord, N. H., water department, Percy R. Sanders, reported that during 1912 the three-year-old pine seedlings raised by the department were transplanted to locations around the reservoir, and 5,000 four-year-old seedlings were purchased from the Concord Electric Company and also set out. Almost all of these have thrived, very few having died for any reason; but the older trees were threatened by the gypsy moth and the brown-tail moth, which did considerable damage.

In Springfield, Mass., the Board of Water Commissioners began last year the planting of white pine on the water sheds of the Little River supply, and hope is expressed in their report that succeeding Commissioners will see fit to continue the work, which they believe will insure improved conditions and value of the land owned by the city on these water sheds.

PAVING EARTHWORK COMPUTATIONS.

(Continued from page 856.)

the actual volume between Stations 6 and 6+35 equals
35
(9.3+5.2) — equals 10.2 cu. yds.; or,
50

The actual volume: The volume as picked from the diagram: The sub-station length: The total station length whenever the distance between sections is less than the value of 1, or the total station length.

2d Case.—If the field notes are taken by determining the cuts at points located by measurements from one curb line as shown in Fig. 3, then the field notes are as follows:

O y x v u t W
Left ————— Right
a b d e f g h
W

and M_1 is obtained thus. Place — at the outer end of
O

the field notes and find the sum of the products indicated by the heavy lines. Find also the sum of the products indicated by the light lines Fig. 3. M_1 equals the smaller of these sums subtracted from the greater, or M_1 equals twice the area of the section from the surface line down to a line connecting the points of intersection of the subgrade line with the curb lines, the cuts being figured to this line as in the first case.

Example: Width of pavement 30 feet—

0	10	12	20	30	30
0.6	0.5	0.7	1.1	0.8	0

M_1 equals $(0.6 \times 10 + 0.5 \times 12 + 0.7 \times 20 + 1.1 \times 30 + 0.8 \times 30) - (0 \times 0.5 + 10 \times 0.7 + 12 \times 1.1 + 20 \times 0.8 + 30 \times 0) = 83.0 - 36.2 = 46.8$

If A equals the area of the section shown by hatching in Fig. 3, then A equals $\frac{M_1}{2} - \frac{2CW}{3}$ and since the

partial volume equals $\frac{Al}{2 \times 27}$
Part. Vol. equals $\frac{1}{2 \times 27} \left(\frac{M_1}{2} - \frac{2CW}{3} \right)$
equals $\frac{1}{27} \left(\frac{M_1}{4} - \frac{CW}{3} \right)$

The method of constructing a diagram for obtaining the Part. Vol. from this equation is shown in Fig. 1. When M_1 equals 100, the horizontal distance from the origin to the diagonal line is

$$\frac{1}{27} \left(25 - \frac{CW}{3} \right)$$

and when M_1 equals 50 this distance is

$$\frac{1}{27} \left(12.5 - \frac{CW}{3} \right)$$

The vertical distance to this diagonal line when the Part.

Vol. equals zero equals $\frac{4CW}{3}$.

From an example of this kind of diagram in connection with Fig. 1, when 1 equals 50, C equals 0.5 and W equals 30, the Part. Vol. for M_1 equals 46.8 is 12.4 cu. yds.

The total volumes are obtained the same as in the first case.

3d Case.—If the field notes are taken by determining the cuts at points located by measurements in each direction from the center line of the pavement as shown in Fig. 4, the field notes are as follows:

Left	Center	Right
$\frac{1}{2}W$	x y o v u t	$\frac{1}{2}W$
a	b d e f g h	i

The cuts being figured to the same line as in the first and second cases. M_1 in this case is equal to twice the area between the surface line and a straight line connecting the intersections of the sub-grade line with the curb lines. It is the same as in the second case and is determined as follows:

Place $\frac{1}{2}W$ at each end of the field notes and obtain
0

the sum of the products indicated by the heavy lines (see Fig. 4), also sum of products indicated by light lines; then M_1 is equal to the smaller of these subtracted from the greater. If the sides of the cut are sloping instead of vertical, the method of figuring M_1 is exactly the same, W being the width at the bottom of the cut if the sides slope.

Example: W equals 30 feet.

Left	Center	Right
$\left(\frac{15}{0} \right)$	15 8 0 2 5 15	$\left(\frac{15}{0} \right)$
	0.7 0.2 0.3 0.2 0.7 0.8	

M_1 equals $(0.3 \times 8 + 0.2 \times 15 + 0.7 \times 15 + 0.3 \times 2 + 0.2 \times 5 + 0.7 \times 15 + 0.8 \times 15) - (0 \times 0.2 + 8 \times 0.7 + 15 \times 0 + 0 \times 0.2 + 2 \times 0.7 + 5 \times 0.8 + 15 \times 0)$ equals 40 — 11 equals 29.

From the example of the diagram in Fig. 1 when M_1 equals 29 Part. Vol. equals 4.2 cu. yds. Since M_1 has the same value as in the second case, namely twice the area of the section, the same diagram can be used, or the one that is given in Fig. 1.

The total volumes are obtained the same as in the first case.

If the areas of the sections are to be determined by planimeter or by some other method than those described, the diagram of Fig. 1 can be used for obtaining the volumes by making M_1 equal twice the area of the section between the surface line and a straight line connecting the points of intersection of the sub-grade line with the curb lines.

In general these diagrams have proved very accurate in actual trials and the use of them is a time saver in a city office.

NEWS of the MUNICIPALITIES

Current Subjects of General
Interest Under Consideration

by City Governments
and Department Heads

ROADS AND PAVEMENTS

Sidewalks at Roysse.

Roysse, Tex.—During the past three months Roysse has made some very substantial improvements, having built more than 6,000 feet of concrete sidewalk, with contracts let for about 3,000 feet more. A large brick garage has just been completed on East Main street, to be occupied at once, and several nice residences are nearing completion. The Eastern Texas Traction Company has two grading crews at work in the city limits.

Topeka Will Have 75 Miles of Paved Streets.

Topeka, Kan.—When the 71 blocks of paving for the present year have been laid, Topeka can boast better than 75 miles of pavement. The paving map is not up to date in the City Engineer's office, but it is estimated that there will be not much less than 80 miles after this year's work is done. The amount contracted for this year will run close to 7 miles, the average block being approximately 1-10 of a mile. At the present rate the total amount of paving in the city will almost be doubled in another ten years. Ten years ago there was comparatively little pavement in the city. It was only 15 years ago that the first brick pavement was laid. Now most of the paving is brick, so practically all of it has been laid in 15 years. The bulk of it, probably close to 50 miles, has been laid in the last 10 years.

Building Assumption Roads.

Napoleonville, La.—Work on the Assumption gravel road has started, seventeen cars of gravel having arrived. Work is being pushed along as the gravel is received. Nearly 600 feet of road has been completed. The first stretch began in front of the Enola plantation and will be continued as far as Napoleonville. The planters all along the bayou will lend their teams for the hauling of the gravel. The work is being supervised by Road Overseer Henry Dupre.

Road Builders Object to Restriction of Emigration.

Syracuse, N. Y.—A position strongly adverse to Federal legislation restricting immigration of laborers was taken at Syracuse by the trustees of the New York State Road Builders' Association at Syracuse. The Dillingham bill of the last session of Congress has been revised so as to restrict the number of immigrants from different countries to a percentage of the number of people from the various countries who were in the United States when the last Federal census was taken. The consideration of this bill and other labor legislation was the chief purpose of the meeting of the trustees of the association. While the meeting was executive, it was stated after adjournment that the proposed law would very materially affect the builders of roads and that the association was strongly against it. One effect, it was stated, would be to cut down the force of laborers and increase the cost of construction. The association maintains in New York City a labor bureau through which men are engaged. This plan, it was stated, to a large extent has eliminated the padrone system. While at present a few of the contractors obtain their men through padrones, it was stated that the majority are engaged through the New York bureau. One of the questions discussed at the meeting was that relating to the bettering of the conditions of labor camps on road contracts. It was said that the employers have

adopted more strict sanitary regulations and have taken means to make the camps more attractive for the men. In most instances the contractors are furnishing cots and mattresses and providing utensils for cooking. The question of union labor, it was stated, was not brought up at the meeting as there has been no trouble on this point. The situation as to highway construction in this state was thoroughly gone over, and members of the association said that the trustees placed confidence in the new State Department of Highways and believed that proper supervision is assured. The organization is composed of highway contracting firms. The meeting of the trustees was held at the Onondaga. Among those present were: President S. B. Van Wagenen of Kingston, A. J. Rockwood of Rochester, John E. Johnson of Buffalo, Fred E. Ellis of Melrose, Mass.; T. C. Brown of Schenectady, Frank L. Cohn of Buffalo, John J. Ryan of Albany and John J. Bergen of New York City. Mr. Bergen has charge of the labor bureau.

Repairing East Hartford Roads.

East Hartford, Conn.—There is considerable activity in town at the present time, due to the building of roads and repairing of the macadam already built. Three steam rollers are in use at present, one on the new warrenite and another is to be added in a few days. Another roller is at work on the section of macadam between the short reach and Burnside, while the third is at work on Connecticut Boulevard. The section of the road between the short reach and Church street is to be oiled in a few days. The securing of an oil cart has delayed the work. Following the oiling of this road the state is to take control of it.

8,000 Turn Laborers to Build Good Road.

Alpena, Mich.—Eight thousand business and professional men and farmers in northeastern Michigan on June 9 made road laborers of themselves and constructed more than 250 miles of roadway between Bay City and Mackinaw City. Where there had been at sunrise mile after mile of corduroy road, sand holes and swamps, nightfall found an almost unbroken stretch of graveled highway. The new road forms a part of the state highway from Detroit to Mackinaw City. The section built passes through 48 townships in the counties of Bay, Arenac, Ogemaw, Iosco, Alpena, Alcona, Presque Isle and Cheboygan. Four thousand sand teams and 750 automobiles participated in the great bee. The women of the country also did their share of the work, 2,500 of them being engaged in the task of feeding the workers along the route.

Work Progressing on River Road.

Oswego, N. Y.—Work is proceeding rapidly on the new state highway along the east side of the Oswego River, between this city and Fulton. J. A. Cullin & Company, contractors, expect to have the East Fourth street and the Syracuse avenue pavement completed early next month. The pavement will extend from the intersection of East Bridge street south to Burkel street. When completed, it will be the longest stretch of brick pavement within the city. The contractors since April have finished more than two miles of the highway between Minetto and Fulton in the vicinity of Bundyville. Inspectors from the State Highway Department are pleased with the rapidity in which the work is proceeding. The Walter Bradley Company, contractors on the barge canal at Minetto, has started rebuilding a section of the state highway on the west side of the river which was destroyed by barge canal operators.

The road is now closed to traffic pending the completion of the contract next month. County Superintendent of Highways E. A. Howard expects to hold another conference soon with State Commissioner of Highways Carlisle relative to sections of unfinished state highways. It is expected that the contract for building the connecting link of the state highway along the west side of the river, between Ellen street and the city line, will be awarded soon.

Granite for Repairs to Arch Street Pavement.

Philadelphia, Pa.—An agreement has been reached between Chief Connell, of the Highway Bureau, and the McNichol Paving & Construction Company with reference to repairs to the Arch street wood paving. The paving has been down about a year and is in need of repairs at the intersections of the street railway tracks. It is not because of faulty work, but it has demonstrated that wood blocks do not stand the heavy traffic of the cars. The contractor is bound to keep the street in repair for ten years. At the suggestion of Chief Connell, granite blocks set in gravel concrete will be substituted for the wood at the intersections of the car tracks and for two feet on each side. By making this improvement, the contractor will escape the larger expense of frequent renewal of the wood blocks. The same conditions exist on Market street, but contractor Edwin H. Vare has not yet decided whether he will make the repairs with wood or substitute granite block.

Improvements in Urbana.

Urbana, O.—Plans are being made for paving the city's main business and residence streets. Sewers are being laid and all poles and obstructions have been ordered off the principal streets.

372 Miles of Roads Worked in Pike.

Troy, Ala.—Probate Judge A. C. Edmonson has compiled some interesting figures in regard to the new system of road work in the county, since the work was turned over to one squad in each district, and the individual contract system abolished. Judge Edmonson says that the county has saved \$4,000 since February 1, when the new system went into effect, and more work has been done. It is stated that 372 miles of roads have been worked, some being rebuilt and others built; 2,550 feet of new bridges have been built, and 8,338 feet of bridges have been repaired. There are over six and one-half months more in the year, and Judge Edmonson believes that a remarkable showing will be made at the close of the year. The county convict and hired labor are divided into four road gangs each taking care of the roads in one commissioner's district.

Oiling Roads to Gettysburg.

Gettysburg, Pa.—State Highway Department working forces have begun to oil the roads in the vicinity of Gettysburg in anticipation of the celebration of the semi-centennial of the battle, which will be held next month, and it is intended to have about 120 miles of highway treated within the next fortnight.

Commissioner Wants Expert on Duty at Mixing Plant.

Duluth, Minn.—Commissioner Roderick Murchison, head of the Division of Public Works, will ask the commission to authorize the hire of an expert to pass upon the asphalt to be laid on Duluth streets this year. The expert would be stationed at the mixing plant, as was done last year, when the old Council brought a man from Milwaukee during the paving of East Fourth street between 14th and 23d avenues east. The condition of the mixture before it is laid is highly important. Not only must the ingredients be up to standard, but the temperature must be right if it is to give the best satisfaction. The expert last year was brought from Milwaukee and paid at the rate of \$6 per day. It is not likely that the same man can be secured but another whose qualifications have been found to be of the best will be secured. Duluth is to have a large

quantity of asphalt laid this year. Among the contracts which have been let for asphalt are: East Fourth street between Sixth and 14th avenues east; East Fourth street between 23d and 27th avenues; 22d avenue east between Third and Fifth streets, and East Sixth street between 18th avenue east and Woodland avenue. The inspectors of the City Engineer's office will watch the work which is being done on the streets. With a competent expert at the mixing plant there is little possibility of the property owners not getting all for which they are paying.

Start Work on County Highways.

Janesville, Wis.—Commissioner of Highways Chas. E. Moore of Janesville reports that the season's work is well under way. Contracts have been let and crews are at work in nine towns, engaging over 50 teams. Ryan & Sons are working on the Afton road in the town of Rock, McGavock Brothers are working on the Monroe road in the town of Beloit, H. Wheeler is working on the Bergen road in the town of Clinton; John Jones is working on the Racine road in the town of Bradford; R. N. Finley on the Johnstown road in the town of Johnstown; Charles Wileman on Maple Drive in the town of Fulton; Jas. Finley in the village of Hanover, town of Plymouth; Dan Drew has just finished last year's work in the town of Magnolia on the Honeysett road and will proceed to work on the Footville road in the town of Center; Harvey & Gary are resurfacing the Union road in the town of Union. It will take from two to six weeks to finish the work in these towns, and the crews will proceed to the work in other towns. The balance of the work will be let as fast as the blueprints are sent in by the Highway Commission. A new ten-ton Austin roller has just been unloaded at Beloit for the McGavock job where it is much needed. The county now has four rollers and their services will be taxed to the utmost as the roads are being built with a rock foundation wherever the rock is obtainable, and the intention is to roll the gravel roads when the rollers are not busy otherwise, as the opportunity presents. Some \$70,000 will be spent on the state aid roads this year. Of this sum \$50,000, or thereabouts, will be used in new construction; \$10,000 will be used for repair work, and \$10,000 will be needed to complete last year's work.

172 Miles of Road to Be Improved by Board.

Des Moines, Ia.—Supervisors of Polk County will spend \$20 a mile this year in dragging the county system of main roads. These roads will be dragged after each rain. The entire distance to be covered is 172 miles. All these main roads will be improved. This was a plan of road improvement as mapped out at a meeting of the supervisors and the good roads committee of the Commercial Club. The roads covered by the system include the River-to-River road across the entire county, the White Pole road, the Carlisle road, the Rising Sun and Prairie City road, the Indianola road, the Norwalk road, the East 14th street road, the Polk City road, the Ridge road, the road west from Ridge road through Johnson to Grimes, the Commerce road, and some other roads in the north and east parts of the county.

Parks and Boulevards Are Valued at \$2,497,215.

Indianapolis, Ind.—In its annual report for the year 1912 the Board of Park Commissioners estimates the value of parks and boulevards owned by the city at \$2,497,215. The total acreage owned and used by the city is 1,530.18 acres, which includes Military Park, University Square and St. Clair Square, all of which are owned by the state and upon which no valuation is placed by the board. The Fall Creek Parkway, of 143.32 acres, is valued at \$346,300; the White River Parkway, of 45.55 acres, at \$82,000; the Brookside Parkway, 34.09 acres, at \$63,500; Burdsal Parkway, 9.28 acres, \$31,815; Pleasant Run Parkway, 31.82 acres, \$38,600. Riverside Park, consisting of 930 acres, is valued at \$1,250,000; Garfield Park, 99.38 acres, \$260,000; Brookside Park, 93.05 acres, \$180,000; Ellenberger Woods, 31.70 acres, \$30,000; Woollen's Garden, 44 acres, \$5,000; Willard Park, 14.71 acres, bought in 1905 for \$50,000, is

valued at \$75,000; Greenlawn, 8 acres, is valued at \$60,000; Highland Square, 3.98 acres, \$25,000. Other squares, triangles and small parks made up the remainder of the acreage and valuations. For the first time the board sets out a table showing the total expenditures for park and boulevard purposes from the beginning. These are as follows: Maintenance, \$977,631.65; improvement, \$1,005,722.29; land acquisition, \$1,076,719.35; total, \$3,060,073.29. The first park board was appointed in 1895, and prior to that \$109,500 was spent for land acquisition, which is included in the foregoing figures.

Open New \$30,000 Viaduct.

Jefferson City, Mo.—A concrete viaduct, the longest in any city in Missouri, outside of St. Louis and Kansas City, opened to traffic in Jefferson City. This viaduct carries High street over a large creek and several railroad tracks and is 58 feet high at its highest point. It is 598 feet long, and cost approximately \$30,000. This was one of the projects of the administration of Mayor Cecil W. Thomas. The money for its construction was voted at a special election. A Democratic Council has named it the Cecil W. Thomas viaduct. This work was made necessary by the fact that the state closed one of the principal thoroughfares formerly used by the bulk of traffic. The viaduct is of reinforced concrete. It is 30 feet wide.

County Will Spend \$20,000 on Roads.

Jasper, Ala.—Walker County will spend \$20,000 on the improvement of a single road within the next four months. This was definitely decided by the Walker Court of County Commissioners in a conference with W. S. Keller, State Highway Engineer. The road to be built is Walker County's division of the Birmingham-Jasper highway, which extends from Jasper to Sander's Ferry, where a steel bridge has been recently completed. Plans have been developing for some time to construct this proposed road, and the Walker County plans were laid before State Highway Engineer W. S. Keller, who approved them and stated he would send to the county a corps of engineers for the purpose of locating the route between Jasper and Sander's Ferry, the point where it will touch the Jefferson County division of the road. It is understood that the road will be built by contract methods, the county issuing warrants to pay for the work. The work of grading the road will be started at an early date in order to have it completed by next fall. Walker County has just completed 20 miles of clay road between Jasper and Corona, which will be extended through Fayette County to Columbus, Miss. This road has been graded within the last twelve months and is complimented by those who travel over it. Local road builders expect Fayette County to grade a modern highway from the point where this new road will touch the Fayette County line through Fayette towards Columbus. Another road movement is being launched which, it is stated, will materialize within the next twelve months. It is proposed to build a good highway from Jasper, an extension of the Birmingham-Jasper road, to the Marion County line, and parties in that county are planning to extend the highway through Marion to Tupelo, Miss. It is stated that an 80-mile extension of the road from Jasper towards Memphis will give an unbroken highway from the Mississippi to the Gulf of Florida.

Will Advocate Road Building by Prisoners.

Albany, N. Y.—John N. Carlisle, Commissioner of Highways, and John B. Riley, Superintendent of Prisons, will ask the legislature at the extraordinary session to make an appropriation of \$50,000 for the purpose of utilizing short-term prisoners in the construction of state highways. It is impossible under the referendum act to use any part of the proceeds of the first or second bond issue of \$50,000,000, as it is specifically provided that when highways are improved under the provisions of the referendum it shall be by public letting and competitive bidding. "While all the details of the scheme to use prisoners on the public roads have not been worked out, in a general way," says a statement by the highway department, "it is proposed

to use the short-term men or the men whose terms are about to expire. It will take the men about to go out into the world from the cells and workshops and give them the advantage of a few months of outdoor work, so that they will not have to go out with that prison pallor which so often handicaps them in their struggle to gain a new foothold. Some fear has been expressed that the scheme would meet opposition from the laboring men of the state, and, as a matter of fact, only a very small percentage of the state roads could be built by convict labor, and in any event, the men so employed would be taken from their occupations where even to a greater degree their labor comes in competition with that of workingmen. There are now 1,600 miles of road in New York state under construction and if the prisoners available for this work could be used it would mean a very small addition to this mileage, for they could be used in isolated sections where the obtaining of labor for contractors is a very serious problem and on the state lands of the Adirondack forest preserve where the state has taken up to some extent the construction of highways."

Road Work for Convicts.

Albany, N. Y.—Employment of short-term convicts in the construction of roads throughout the Adirondack and Catskill state parks, in the opinion of John B. Riley, superintendent of state prisons, not only would add greatly to the state's highway system, but also would be of material benefit to the men. The law permits employment of convicts on highways within thirty miles of each prison. Sup. Riley says every convict should be required to work at heavy manual labor, preferably with pick and shovel, several months prior to his discharge. He then would have no difficulty in finding employment with contractors engaged in road building.

SEWERAGE AND SANITATION

Sewers, Then Pure Water.

Harrisburg, Pa.—State Commissioner of Health Samuel G. Dixon has directed the institution of a suit against the borough of Farrell to enjoin issuance of \$125,000 of bonds for a municipal water plant, on the ground that it was against public policy. The borough had been ordered to prepare plans for a sewage disposal plant, but has failed to comply. The debt limit of the borough will practically be reached by the sale of the bonds, which will prevent it from making expenditures for sewage disposal. Suit has also been brought against the borough for extending sewers without a State permit.

Decision Will Cost the City \$7,000,000.

Grand Rapids, Mich.—By a decision of the State Supreme Court at Lansing, the city of Grand Rapids is enjoined from dumping sewage into the Grand river. To obey the ruling of the court, the city will have to reconstruct all sewer outlets, which now open into the river, and a large part of the system, which includes 192 miles of sewers. In addition, land must be purchased and two immense septic tanks built, one on each side of the river. The estimated cost of the change is \$7,000,000. The court's action is the result of a suit brought against the city by down river rural districts to combat the sewage peril during periods of low water. Grand Rapids will be the first of the large cities along the shores of Lake Michigan to be restrained in accordance with the recent resolutions of Federal engineers from polluting that body of water by contaminating streams that empty into it.

Tests Show Water Supply Is Pure.

Rahway, N. J.—Gratifying reports were received at the meeting of the Board of Water Commissioners from Bacteriologist N. S. Hill, showing that ninety-eight and nine-tenths of all bacteria was the average of removal for the past month and that the minimum had been ninety-seven. Other parts of the report showed the following: "No trouble has been experienced during the month in the operation of the filters. The turbidity and color of the raw water

has been rather low for this water. At no time has there been any evidence of turbidity, color, or odor, in the daily samples of the filtered water and the filtered water has at all times been of excellent sanitary quality and entirely suitable for drinking or domestic purposes." Engineer David Gage reported that 51,553,242 gallons of water had been pumped during the month, a decrease of 5,460,816 gallons from the corresponding month a year ago.

City Has a Sewer Problem.

Cadillac, Mich.—Cadillac wants to make an extension to its sewer system and finds that the pumping station used to pump from one level to another and the sewage disposal plant are far too small to take care of any greater capacity. An expert will be brought to the city to point out the next move.

WATER SUPPLY

New Reservoir in Use.

Chehalis, Wash.—The new reservoir for Chehalis water supply is now being used. The Washington-Oregon corporation had the old one practically rebuilt and its capacity increased to 800,000 gallons. The reservoir will be enclosed with tight fences as a further protection to the water supply.

City Wells Yield 300 Gallons a Minute.

Gilroy, Cal.—The two new wells of the city of Gilroy lately bored near the gas works at the Sixth street railroad crossing were shot with dynamite, and the suction pipes were extended a distance of 20 feet, making a total length of about 55 feet. The wells have now been tried out with a two-step, six-inch centrifugal pump, driven by a 50-horsepower electric motor. The test has proved a success, and the wells are now yielding about 300 gallons per minute. These wells will be a needed addition to the two wells that have been in service during the past three years.

Work Recommended on Water Main.

Hancock, Mich.—The laying of the remainder of the water main and completing of the system commenced last fall has been commenced under Contractor William Ryan, of Ripley, who has charge of the work. Mr. Ryan has a force of twenty men at work on the job. Last fall about one-half of the contract was completed, and then, owing to the lateness of the season and weather conditions, the remainder of the job was left to be completed this year. There are still about 4,000 feet to be laid, but the work is being rushed as rapidly as possible and Mr. Ryan says that with the present nice weather and the same rate of work which is being accomplished at present, the job will be finished in from three weeks to a month or thereabouts. A little difficulty may be experienced, however, when the gang reaches Fifth street, as the situation there will impede the work. So the residents of the village who did not do their connecting last year will be able to have running water in their homes in a month's time. The village council has ordered more meters, which will help matters along somewhat, and the water system should be in full swing soon.

Reservoir Nearly Filled.

Johnstown, Pa.—The recent rains have almost realized the expectations of the Manufacturers' Water Company engineers that Quemahoning Dam would be filled during the present spring. The embankment was practically completed March 1, a little too late to get the benefit of the heavy winter precipitation. It was hoped, however, and now looks probable, that the dam will be filled to spillway level by the end of June. At present the water level is two feet below the spillway and the quantity stored amounts to 10,400 millions of gallons. The area of the reservoir is such that two feet more in height will add about 600 millions to this quantity. The structure has more than met the expectations of the company in regard to tightness and cannot fail to impress anyone with its stability and solidity. The advantages of having a large storage reservoir at this point has been shown probably three times during the present spring

by the fact that the height of water in the Stonycreek River after heavy rains was not more than 80 per cent. of what it would have been if the rainfall over about one-fourth of the watershed had not been stopped by the dam. This will always be true, Cambria engineers say, except possibly during the winter and early spring, when the dam may be full, but even then the effect of the large pondage in retarding the flow will be beneficial. The permanent roads on both sides of the dam are being pushed to completion, and with the work now being done by the State forces between Davidsville and Holsopple and the work which is being done, or to be done, by the township supervisors on the roads nearer the dam, in the course of a month or two, the people of the city can enjoy a pleasant drive of about 35 miles around probably the most beautiful body of water in the State.

Fail to Strike Water for City.

Oregon City, Ore.—Efforts of the special water committee to discover a flow of pure water as a source for the municipal supply received a blow when the drilling outfit that has been busy for the past several weeks on the Ladd tract, near Mount Pleasant, reached a depth of 260 feet without striking an adequate yield. The results are particularly disappointing to Chairman Tooze and the other members of the committee, as the earlier outlook at the spot was most favorable, a flow of 75 gallons a minute having been struck after some 65 feet of drilling. Since passing the 65-foot mark, several small streams were encountered, but none that have a sufficient volume of water. Drilling was continued, however, until the 250-foot level was reached. This was the original limit set by the special water committee; but as no adequate supply was reached at that depth, the diamond point was set to work again, and 10 more feet were bored. No water being reached at that depth, operations were suspended and the special committee that has the work in charge will report to the Council when it will be decided whether or not further drilling is to be tried in the same locality.

The site of the test well was selected by Robert Dieck, consulting engineer for the city in considerable improvement work. Dieck was of the opinion that water ought to be found at this point, but either his computations were incorrect, or else sufficient depth has not been reached by the drill. In order to experiment at this point the city obtained an option from the Ladds to the property, with the understanding that Oregon City could purchase the tract at reasonable terms should water be found.

STREET LIGHTING AND POWER

Reject Municipal Light Project.

New Castle, Pa.—By a vote of 2,090 to 582 the municipal electric light plant project was defeated in a regularly conducted election. A trifle over half the registered vote was recorded. According to the sentiment expressed in connection with the proposition the citizens are not opposed to municipal ownership but felt as though the city could not afford to build the plant at this time on account of its financial condition.

White Way for Akron.

Akron, O.—When H. Whitford Jones, the city's light expert and electrical engineer, completes his ideas for street lighting, Akron will have the best lighted streets of any city in Ohio. The plans at present provide for the installation of 219 flaming arcs on the streets of the business section. Each arc will be mounted on the end of a 16-foot ornamental post. This will place the direct line of the light above the sight of pedestrians. The poles will be round instead of square. The arcs are being furnished by the General Electric Company, of Schenectady, N. Y.

Lights Installed at Hibbing.

Hibbing, Minn.—The installation of ornamental posts for the white way was started by the water, light, power and building commission at the south end of Third avenue and is being pushed rapidly. It is expected that all the posts will be installed before the end of the week. The posts

are of iron, tall and slender and of handsome design. Each post will carry five lamps and four posts will be put in on each side of each block. Lights will be installed on Pine street, from First avenue to Fourth; on First avenue, from the bridge to Pine street; on Second avenue, from Pine to Center street; on Cedar street, from Second avenue to Third avenue; on Third avenue, from North street to the Missabe depot. It is expected that lights will be turned on for the completed white way before July 4.

Council Cuts Light Rate.

Port Clinton, O.—After several months' parleying, the city council has passed an ordinance by which it established a rate of eight cents for the first 10 hours for electric lighting for the city and a flat rate of 75 cents per month. The Northwestern Ohio Power and Light Co. has been endeavoring to secure a franchise for furnishing light to the city at a rate of 10 cents per kilowatt hour and a flat rate of \$1.00 per month. The present rates are \$1.50 per month and 15 cents per kilowatt hour. The old franchise still has three years to exist. Wm. G. Clark, an electrical expert of Toledo, hired by business men to show what could be done in the way of a municipal plant, reported an entire new plant could be established in connection with the water works power plant at a cost of \$30,000. The council gives the Northwestern company till August 1, 1913, to comply with the prices named in the ordinance.

Lighting System in City to be Changed.

De Pere, Wis.—A new system of street lighting has been adopted by the De Pere council, involving an additional expenditure of about \$1,800 per year. The use of arc lamps will be dispensed with except in the business district. One hundred-watt tungsten lamps will be used at every street intersection, and 60-watt lamps on the bridge and at the middle of long blocks. In all, there will be light distribution from 214 points instead of 54 points, as at present. The De Pere Electric Light and Power Company will begin the work of installing the new system as soon as the material can be secured.

Light Company Makes Improvements.

Muncie, Ind.—The Muncie Electric Light Company is making extensive improvements at the general plant on North Walnut street for the purpose of meeting the greater demands which will be placed upon the local power-house by the new Alexandria-Marion tie-line service. The work of extending the main building to the north as far as the sidewalk on North street; the erection of another immense stack and the excavation of large pits for coal purposes are some of the most important improvements contemplated by Chief Engineer J. T. Lovett. The towns of Alexandria and Elwood in addition to Hartford City, Gas City, Jonesboro, Marion and several smaller places are to be supplied with current from the local plant. With the completion in the near future of the service line to Alexandria the circuit between these towns will be complete. The line will extend from the local plant to Hartford City, through Marion, down to Elwood and Alexandria and back to Muncie. The object in making the circuit is to decrease the probability of depriving any of the towns from current at any time. In case any portion of the line is wrecked the current may be supplied through either the north or west extension lines by way of either Hartford City or Alexandria.

Three Miles of Sidewalk Electroliers.

Los Angeles, Cal.—With a great white way more than three miles long, Seventh street, the most important lateral artery of traffic in the city, is soon to turn night into day with sidewalk electroliers, placed 100 feet apart, all the way from the Los Angeles river to Hoover street. Contracts for the manufacturing of the posts have been let since December and it is expected the whole shipment will be delivered during the month of June. City Electrician M. T. Monyhan is authority for the statement that the setting of the posts will be started early in July, and as the contract requires the work to be completed within thirty days it is expected the lights will be turned on about August 5th. While the new lighting system perhaps will be the most spectacular it is by no means the most important betterment planned by the Seventh Street Improvement Association,

which includes members representing fully \$50,000,000 in property values. New skyscraper office buildings, commodious quarters for department stores, modern hotel and apartments and a general improvement in buildings are included in the aims of this organization.

FIRE AND POLICE

Fire Alarm System Completed.

Hazleton, Pa.—The new fire alarm system is about completed and tests are now being made of the whistle. During the tests a very light air pressure is being used and as a result the sound of the whistle is not very audible. Supt. McCarron states that if when everything is completed, the whistle does not give a satisfactory tone, a new one will be secured. During the past few days the whistle has been blown under an air pressure of but forty pounds, which is not quite half the pressure required for it to send forth its full blowing capacity.

Works Board Accepts New Police Station.

San Francisco, Cal.—The construction of the North End Police Station has been completed and the building was accepted by the Board of Works. It is considered a handsome and well-arranged structure. The Board approved the specifications for clearing away the exposed foundations at the City Hall ruins. The serviceable bricks are to be cleaned, the steps and curbing in the foundations removed and the damaged brick and stone crushed.

Iowa Cities Fire Loss Per Capita.

Des Moines, Ia.—The fire loss per capita in the city of Fort Dodge during the past fiscal year was \$2.53. Other cities in the state suffered varying amounts per capita by fires during the past year. Clinton had the smallest loss, suffering only 25 cents per capita, while Sioux City had a fire loss of \$12.69 per capita. Des Moines, the largest city in the state, with a population of nearly 90,000, had a fire loss per capita of \$3.97. Sioux City, with 51,000 population, had a per capita loss of \$12.69. Waterloo was third in the state, with a per capita loss of \$6.71. The per capita loss of the larger cities in the state was as follows: Burlington, 36 cents; Cedar Rapids, 71 cents; Clinton, 25 cents; Council Bluffs, \$1.78; Fort Dodge, \$2.53; Davenport, 68 cents; Des Moines, \$3.97; Dubuque, \$2; Ottumwa, \$10.65; Sioux City, \$12.69, and Waterloo, \$6.71. The total loss in some of the larger cities in the state was as follows: Burlington, \$9,009; Cedar Rapids, \$25,905; Clinton, \$6,400; Council Bluffs, \$57,130; Davenport, \$30,324; Fort Dodge, \$53,147; Des Moines, \$356,957; Dubuque, \$80,000; Ottumwa, \$244,822; Sioux City, \$657,219; Waterloo, \$187,967. Fort Dodge exceeded the fire loss per capita of the United States. The loss here per capita was \$2.53, while the per capita loss of the entire country is \$2.33.

New Fire Whistle.

Haverhill, Mass.—The new air whistle, which is to announce alarms of fire from the top of the Central fire station, will be erected early next week. The apparatus has arrived and is ready for the experts from Boston who will set it up. The new whistle will replace the steam whistle which has done duty at the Jaques plant for many years. Alderman Bartlett recommended its installation at the time he submitted his annual report, and he later offered an order for an appropriation of \$1,100 to pay for it. The city now pays \$300 a year for the maintenance of the steam whistle on Washington street, it being necessary to keep steam on at all times of the day and night, but with the new machine, which operates by electricity, no power will be required except during the blowing of an alarm, so that within a short time the whistle will have paid for itself in the rental and will then become the property of the city and without further expenses except for the necessary current to operate it. The whistle is similar to the electric air whistles now maintained on the Massachusetts electric cars, though much larger, and its deep-toned blasts will be heard throughout the city and several miles away from it, too. The whistle is to be mounted at fire department headquarters, where it will be under the supervision of Lieut. McLean, who is the department's electrician.

MOTOR VEHICLES

No Street Auto Wanted.

Montpelier, Vt.—At a largely attended special city meeting the voters turned down the request to authorize the purchase of an auto truck at a cost of \$4,900 for use by the street department and defeated a motion to levy a special tax of 25 cents on the dollar of the grand list to meet the expenses of street improvements for the rest of the year.

Fire Truck Demonstration.

Martins Ferry, W. Va.—The Weller-Thomas Co., of Zanesville, manufacturers of auto fire trucks demonstrated one of their chemical auto engines in Martins Ferry recently and the tests all proved very satisfactory. The company is taking the machine over the country for the purpose of giving the cities that are thinking of purchasing a truck a demonstration. The truck will be exhibited in Wheeling after leaving Martins Ferry.

Athol's Auto Fire Truck.

Athol, Mass.—The arrival of the new Seagrave automobile combination hose truck from Columbus, O., makes a fine addition to Athol's fire-fighting forces. It has been given several trials up School street hill and at other places where there is a heavy grade and so far everything has worked satisfactorily. The machine will be given a thorough 10-days' trial with a demonstrator in charge, and it will then be accepted by the town. The machine is to replace hose wagon 4 in the station 1 department.

Money and Time Saved By Use of White Motor Trucks.

Boston, Mass.—Substantial economies in the hauling of paving material and supplies have been effected by the Warren Brothers Company, Boston, Mass., with two White trucks of five tons capacity and one of 3,000 pounds. In less than a year's experience and without materially changing the facilities that had been developed for horse service, the officers of this company have reduced their hauling costs 33½ per cent, and placed their order with the White Company for three additional trucks. Ten of the twelve horses that were formerly maintained in their big Cambridge yards have been supplanted, and a considerable part of their wagon equipment has been adapted to the use of trailers with satisfactory results. When horses were used exclusively, the operations of the company were limited to a ten-mile radius from the center of Boston, and the greater part was inside a seven-mile radius including about seventeen adjacent cities. This limit of carting distances has been due to the fact that the bitulithic surfacing material, which is composed of certain proportions of crushed stone, gravel and fluid asphalt, is mixed at a temperature of 300 degrees, in the Cambridge yard, and must be loaded, hauled and dumped before it cools. When trailers were used the trucks supplanted five and six teams, according to the character of the work and the distance of the haul. The use of trucks, furthermore, extended the

area in which paving contracts could be made and on one occasion, a contract was performed in Haverhill, 38 miles distant. The trucks were used to carry tools and equipment both ways, saving freight charges and considerable time. The trailers, in addition to hauling surface material, carried the portable furnaces and heating material. The work can be done only in dry weather, making it necessary to have the hauling done as expeditiously as possible. It must be delivered in practically the same consistency as when it is unloaded from the mixer into the dumping body of the truck, and it is also necessary to have a sufficient number of men at work on the paving job to handle the surfacing when it arrives. It is, therefore, a proposition involving mixing, loading, hauling and dumping with the minimum loss of time. The company figured that a motor truck, in order to be preferable to horses, must actually earn \$15 a day. Careful figures which have been compiled by the company covering both horse and motor truck installations show that each White truck did the work of three two-horse teams and occasionally four teams. Both of the dump trucks are built with sheet steel bodies of special design, but they are elevated by the standard White power dumping mechanism, which allows an angle of 45 degrees. The bodies are 11 feet long, six feet wide, and eighteen inches deep, having a capacity of 100 cubic feet. The paving material weighs about 100 pounds to the cubic foot, making a full load exactly five tons. The 3,000 pound truck is fitted with a regular stake platform body.

Official Test Satisfactory.

Chase City, Va.—So far as fire protection is concerned, Chase City is now prepared to cope with most any kind of situation. The new fire-fighting apparatus was given a tryout, and although the tower was only about one-third full the pressure was sufficient to throw a two-inch stream over the tallest buildings. In case of fire four streams can be brought to play upon the blaze. Three fire stations will be located in different sections of the town, equipped with ample facilities to take care of almost any fire that may occur within the corporate limits. "It will be almost impossible for us to have a serious conflagration with our present facilities for fire-fighting," said Captain T. W. Greer. "The pressure is ample, and we have sufficient hose to reach almost any section of the city. I am in favor of at least three stations, and members of the company to be selected who reside in close proximity to these stations. The company will be thoroughly organized, and when this is done we will be ready for business."

New Auto Fire Truck in Use.

Fort Dodge, Ia.—The new auto fire truck has been installed at the Central fire station, and in the future all alarms turned in at this station will be answered by the big Pope Hartford truck. The chemical wagon in use at the Central station will be moved to the station on First avenue, and the equipment in that station will be put in storage.



WHITE TRUCKS DELIVERING SURFACE MATERIAL AND HAULING HYDRAULIC CEMENT.

Use of Motor Trucks by Street Cleaning Department.

New York, N. Y.—The New York Street Cleaning Department has recently commenced experiments to determine the adaptability of motor trucks for the removal of garbage and street refuse. They have used several makes of



INTERNATIONAL MOTOR TRUCK USED TO COLLECT GARBAGE.

trucks in their experimental work but have had difficulty in getting a machine with a sufficiently low center of gravity to enable the load to be dumped from the pier without danger of overbalancing the truck with its consequent disasters. The International Motor Company has built a body on its Sauer chassis which is well adapted for this purpose.



DUMPING GARBAGE INTO BARGE.

As will be seen in the picture of the truck dumping its load over the pier into a barge, that although the conditions of the dump are such that the enormous overhang tends to overbalance an ordinary truck the low center of gravity of the Sauer chassis and the distribution of the weight enables the load to be dumped without requiring weight on the front wheels to prevent the truck from tipping over.

GOVERNMENT AND FINANCE

To Invoke Recall to Oust Mayor.

Janesville, Wis.—A petition for the recall of Mayor Fathers has been filed. The election will be held June 22.

Commission Rule for Jersey City.

Jersey City, N. J.—Jersey City held its first commission government election June 10th, choosing five men who will rule the city for four years beginning June 17, unless any or all of them shall be recalled. Mayor H. Otto Wittpenn automatically will go out of office. There were ten candidates in the field. Five of them had the backing of

Mayor Wittpenn. Of these only one, A. Harry Moore, city collector, was elected, receiving about 15,400 votes. The other four elected were Mark M. Fagan, Progressive, thrice mayor of Jersey City, who received 21,400 votes; George F. Brensinger, Democrat, former assemblyman, 19,000 votes; Frank Hague, Democrat, street and water commissioner, 17,400 votes, and James J. Ferris, Democrat, 18,100.

Commission Rule for Beverly

Beverly, N. J.—Beverly city voters have decided to adopt commission government at a special election. In the election 331 votes were cast, the winners having a majority of 37.

Financial Troubles Confront Cleveland.

Cleveland, O.—Serious financial difficulties will confront both the city and the county next year as the result of the present taxation problem, City Auditor Thomas Coughlin and John Goldenbogen, clerk of the Board of County Commissioners, asserted after the first meeting of the County Budget Commission. The city will be short between \$1,000,000 and \$1,500,000 of its estimated needs, said Coughlin. The county will be short of its absolute necessities between \$300,000 and \$400,000, said Goldenbogen.

Few Bids for Stock of City.

Baltimore, Md.—Illustrating the tightened condition of the money market, bids were made for only \$567,900 of the \$5,500,000 block of Baltimore City 4 per cent. stock offered for sale by the Commissioners of Finance. The average price bid was 90, the highest figure quoted being 95 for \$5,000 worth of stock and the lowest 87.91 for a similar amount. At the last city stock sale, when \$5,000,000 worth of stock was put on the block, more than \$3,000,000 was subscribed for. The price at that time averaged more than 96. Baltimore's experience follows that of other cities which recently have offered city stock and bonds with very discouraging lack of success.

City Council Goes Out of Existence.

Battle Creek, Mich.—Battle Creek's common council, long the governing body of the municipality, has passed out of existence, the new commission form of government taking effect with the swearing in of Mayor John W. Bailey and Commissioners W. H. Mason, Howard Kneeland, John MacGregor and L. W. Underwood. The commission at once went into informal session to "get acquainted" and discuss the departments that each of the four men would like to manage.

Expenses Decrease Under Commission Government.

Trenton, N. J.—Price, Waterhouse & Co., who recently gave the city's books a thorough auditing, have presented the result of their accounting to the city commission in session. The figures represent the business of the city under its first year of government by commission, and they should be a source of gratification, not only to the commission itself but to all friends of this new system of municipal government. The report, up to the close of the commission's first fiscal year, February 28 last, shows first of all that not only had the constantly growing increase of the past few years been eliminated but an actual decrease in the expenses of operating the city government has resulted under the commission's rule. In a table of figures in which details of the decrease are given it is shown the amount of increase at the fiscal year ending February 28, 1910, was \$6,177.30, or 1.08 per cent.; in 1911, \$60,736.46, or 10.33 per cent., and in 1912, \$102,843.45, or 15.85 per cent., while the decrease in 1913 was \$4,377.31, or .58 per cent. In comparing the five different departments, that of the mayor, department of public affairs, indicates a decrease in expenditures over the preceding year of 18.18 per cent., revenue and finance decrease of .54, public safety an increase of 4.09, streets and public improvements an increase of .42 and parks and public property a decrease of 2.78 per cent. The total decrease, the auditors state, has not been obtained by a lowering of standards or a suspension of activities, but by calling into play new methods of administration. Price, Waterhouse & Company, in their report, suggest to the city commission that it have the various departments prepare efficiency reports.

STREET CLEANING AND REFUSE DISPOSAL.

Street Cleaning Cost \$3,483.

Richmond, Ind.—Street Commissioner D. C. Genn reports that the cost of street cleaning for the year will show a saving of \$924.76 over the cost of the work last year. The entire cost this year was \$3,482.70, while that of last year was \$4,208.46. The work this year was done in three weeks less time than it was last year, requiring nine weeks this year. The work was done by thirty-four men and seven teams. The lower cost of the repairs for the present year was ascribed by the Street Commissioner to the fact that he has personally supervised the street cleaning, while last year he was busy repairing the streets and permitted the cleaning to be done under another man's supervision.

Will Dispose of Garbage in River.

St. Louis, Mo.—St. Louis this summer will dump all its garbage in the Mississippi River, under authority granted by the Federal Government to meet an emergency which has existed since February 1, when the Great Western Chemical Corporation, which operated the Stallings (Ill.) reduction plant, served notice it no longer could dispose of its garbage on account of bankruptcy proceedings. William S. Mitchell, in charge of the division of the United States Engineering Office in St. Louis, which regulates dumpage in the Mississippi River, twice had conferred with Mayor Henry Kiel and other officials of the city on the weekly trips on the harbor boat Erastus Wells. Two weeks ago, with Mitchell's recommendation attached, the city forwarded a request to Washington for a grant to use the river this summer. With the request went a long letter explaining affairs, and due warning of the complaints expected from down-river towns. City officials received assurance from a private source their request would be granted, and officially released announcement of their plans. Three weeks ago, when the Board of Public Improvements received bids for a six months' contract for garbage disposal, E. J. Cassily, who was one of the receivers of the Great Western Company, was the lowest bidder. He asked 87 cents a ton. The Stallings company disposed of all garbage for three years at 27 cents a ton. The city, on the average, has 100,000 tons of garbage each year, and three-fourths of this is collected during the summer. With each bid, the Public Improvements Board required an explanation of how the bidders proposed to get rid of the refuse. Cassily's explanation was that he would take it ten miles below St. Louis on barges and there dump it into the river. He explained he easily could obtain a permit for six months from the Federal Government. "If an individual can get this grant, why can not the city?" was asked by a board member, and a conference on the harbor boat to discuss the chances of "beating Cassily to it" was called. In secret, plans were laid to put the matter before the Washington authorities, and not until the city was assured the request would be granted was the arrangement officially made public. Since the Stallings plant shut down city garbage has been hauled on barges to Chesley Island, where it has been plowed under. All available land was soon a foot deep with garbage, which was covered with lime. About two weeks ago the city was "up against it," as the Mayor explained it, and a portion of the garbage each day was dumped in the river.

Municipal Dumping Ground Draws Bears.

Hoquiam, Wash.—Bear hunters of Hoquiam have good luck in finding game at the site of the refuse heap, or municipal dumping ground, north of the city. Not long ago the carcass of a horse was hauled out there and left, which proved tempting bait for bruin. Some hunters hearing of this, and anxious to give their dogs a chance to show their mettle, started out for the big game, with the result that two bears were killed, a third making its escape by swimming the river, while still another was wounded in the evening, but fell into some brush, and as it was supposed to be killed, was left till morning. During the night, however, the wounded bear escaped.

RAPID TRANSIT

Lower Car Steps After July 1st.

Washington, D. C.—Lower steps will be provided on all new street cars placed in operation in the District of Columbia after July 1 next, if favorable action is taken upon a tentative regulation promulgated by the public utilities commission and considered at the first public hearing given by that body. Washington street railway heads, including George E. Hamilton, president of the Capital Traction Company; Clarence P. King, president of the Washington Railway and Electric Company; representatives of citizens' associations and others attended the hearing, which was conducted in the board room of the municipal building and lasted two hours. The proposed regulation concerning the height of car steps is in the nature of a compromise. Citizens who appeared before the old District electric railway commission urged a maximum height of twelve inches for car steps. The rule, tentatively adopted by the commission, provides that on all cars placed in operation after July 1 no steps above the rail and no subsequent steps shall exceed fourteen inches in rise. Open cars are not affected by the proposed order, while on closed cars already in service no step shall exceed sixteen inches in rise after September 1, it is provided.

Claim Municipal Railroad Shows Deficit.

San Francisco, Calif.—The proposal of the present board of supervisors to build a whole series of railroads ramifying throughout the city of San Francisco in carrying out their public utilities plan and cause the city to go more thoroughly into the street-car business is now before the people. The proposition is to issue \$3,500,000 worth of municipal bonds to build these various roads, and the general admission is that after all this money is expended it will not thoroughly equip them. This is a matter of serious concern to the taxpayers of San Francisco. In line with this consideration of so important a subject, the city has an object lesson in the present Geary-street railroad. Four different elections were held in which the question of whether the city should engage in running street railroads was brought up. These elections occurred (1) December 2, 1902; (2) October 8 1903; (3) January 24, 1909; (4) December 30, 1909. The city paid out in interest during the time it was building this road the sum of \$123,685.35, which made the total amount of the elections and interest paid before the road began to earn a dollar, \$251,804. The amount of bonds sold by the city up to March 31 was \$1,963,000. Below is published the statement of the income and expenses of the Geary-street road for the four months ending April 30, 1913. The reader will notice that it shows a deficit of \$17,380.63.

Operating Expenses.

Gross earnings	\$83,443.70
Maintenance of way and structures.....	\$1,303.54
Maintenance and equipment.....	1,905.12
Transportation expenses	42,618.03
General expenses (estimated).....	2,000.00
Total operating expenses.....	\$47,826.69
State taxes, 4¾% of gross earnings....	3,963.58
Franchise tax, 3% of gross earnings....	2,503.31
Operating expenses and taxes.....	\$54,293.58
Net earnings	\$29,150.12
Interest on floating debt, \$251,804.92, at rate of 5%.....	4,196.76
Interest on outstanding bonds, \$1,963,000 at rate of 4½%.....	28,868.32
Total interest	\$33,064.08
Deficit	\$3,913.96
Sinking fund accruals.....	13,466.67
Total deficit	\$17,380.63

Court Rules Commission Cannot Supervise Car Lines.

Washington, D. C.—Street car lines are not subject to regulation of the Interstate Commerce Commission. The Supreme Court so decided in annulling the Commission's order for a five-cent reduction of the fare from Omaha, Neb., to Council Bluffs, Iowa. Justice Lamar, announcing the Court's decision, said that Congress in using the word "railroad" in the interstate commerce laws had not used it in the sense of a "local" line, such as a street railway was essentially. Twelve States have held the word "railroad" included a "street railroad" and 12 that it does not. Judges Sanborn, Hook and Adams, of the United States Circuit Court, held that the Commission did not possess the power to regulate street railways crossing State lines, while the Commerce Court held that it did. Attorneys for the Interstate Commerce Commission interpreted the decision as not depriving the Commission of jurisdiction over electric lines which are essentially competitors of steam railroads in interstate commerce.

MISCELLANEOUS**City Will Have Municipal Ice Plant.**

New York, N. Y.—By a vote of 12 to 4 the Board of Estimate approved the resolution proposed by Borough President McAneny to provide \$40,000 to enable the city to manufacture ice at two plants for its own consumption and for sale, at cost, at municipal milk stations. The Mayor and Borough President Miller of the Bronx voted against the project.

Name Street for Mark Twain.

Hannibal, Mo.—Hannibal again has honored the late Mark Twain, famous humorist, whose boyhood days were spent in Hannibal. The city council has passed an ordinance designating that Palmyra avenue shall be known as Mark Twain avenue in the future. The humorist played on that street when a boy.

Baltimore's Municipal Bureau.

Baltimore, Md.—To furnish manufacturers looking for sites for plants information as to Baltimore's advantages in this regard and to make those same advantages generally known to the world, the city of Baltimore operates, as part of the municipal government, a bureau known as the "Factory Site Commission." The operations of the Factory Site Commission are varied and far-reaching. It is organized on a basis that put it in touch with all the different business interests of the city. The Commission is made up of a member from each one of the following organizations: Merchants' and Manufacturers' Association, Old Town Merchants' and Manufacturers' Association, Federation of Labor, Builders' Exchange, Real Estate Exchange, Pennsylvania Railroad, Baltimore and Ohio Railroad and Western Maryland Railroad. Primarily, the work of the Commission was to secure sites for industries that might come to Baltimore from other cities, but its activities have expanded and it takes a keen interest in helping local industries in their expansion and in straightening out difficulties of various kinds that confront business men.

City May Enter Realty Business.

Washington, D. C.—The District of Columbia government may go into the real estate business, with the object of improving living conditions in the capital's slums and alleys. In connection with their consideration of the bills introduced in Congress providing for the conversion into interior parks of Goat alley and Snow's court, the Commissioners of the district, it was learned, are working on an excess condemnation plan, by which they not only may acquire ground for minor street purposes, but may obtain land abutting thereon to be sold for building purposes under certain restrictions. The whole question of the merit of interior parks versus minor streets, is being thrashed out by the Commissioners and engineer officials of the local government. It is learned through authoritative sources that the interior park plan is disapproved by the majority, if not all of these officials, and that, in the reports to be

submitted on the Goat alley and Snow's court bills, recommendation may be made for the construction of minor streets through these inhabited sections. It is pointed out that an interior park has little or no esthetic value, since it is surrounded by the back portions of premises, and that it does not solve the problem of providing suitable living conditions for the persons forced to move out of the areas that are converted into parks of this character. Minor streets, it is suggested, will make possible a solution of this problem if the Commissioners are given authority to make excess condemnations so that ground abutting that needed for the minor travelways can be acquired. Under such a plan the Commissioners, it is stated, could divide the excess ground into small building lots and sell them to the highest bidders under restrictions that would insure only sanitary houses being constructed on the property.

Council to Wage War on Noisy Frogs.

Spring Lake, N. J.—The obliging councilmen of Spring Lake, heeding the complaints of shore residents that the chorus of the frogs disturbs their slumbers, announced that they would advertise in a few days for bids to exterminate the songsters of the swamps. Not long ago several people protested so strongly at the matutinal honking of the municipal geese that the council, despite counter protests, ordered the birds removed. Comes now the fiat against the frogs, and the attendant possibility of a reward for the exterminator.

No More Saloons for Los Angeles.

Los Angeles, Cal.—Mayor-elect Henry H. Rose announces that Chief of Police Charles Sebastian will hold his job, but that Police Commissioners G. W. McDill and J. V. Akey, and Water Commissioner Frank G. Henderson and S. C. Graham, all identified with the former good government organization, "will be fired," forthwith. McDill and Akey said they would not be fired. They would quit first. Los Angeles now has fewer than the charter limit of 200 saloons. The new Mayor, in a public statement, declared that no more liquor licenses would be issued. Referring to the social evil, he said it would "be treated in a sane manner." The city has no segregated district, but the recent "white slavery investigation" revealed the existence of pseudo hotels.

Farming of Streets to Be Stopped.

Woodland, Cal.—On the petition of J. H. Rupley et al the Board of Supervisors has instructed District Attorney Bailey to bring suit against those who are obstructing the public highways in the Beamer Addition. It appears that certain highways have never been opened, but are farmed by adjoining property holders.

Ice Water Drinking Fountains.

Cambridge, Mass.—The city of Cambridge in 1904 operated four drinking fountains, which furnished ice water during the summer months, and in 1907 this number was increased to six. In the summer of 1911 five of these were in operation. The cost of maintaining these, of course, depends very largely upon the cost of ice. These costs have varied from 94 cents to \$1.34 per day per fountain, except that in 1906, when the price of ice was about double what it was both before and after, the cost rose to \$1.57. The figures during most of this time were based on prices of ice varying from 12½ cents to 15 cents per 100 pounds. The fountains are operated an average of about 110 days in the year.

Town Is Century Old.

Harrison, Ind.—The members of the George Washington Fire Company and the citizens of the little hamlet of Harrison, in Dearborn County, are preparing to celebrate the one hundredth anniversary of the town the first week in July. Isaac Brinkman, Mayor, and his committees are endeavoring to make this centennial a notable event. Jonas Crane made the first purchase of land west of the Big Miami River, in this section, in 1806, and with the assistance of Peter J. Refner laid out and placed the site of the town of Harrison, in July, 1813. This week of celebration also will be old settlers' and homecoming week.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Defective Street—Evidence.

Gutzman v. City of Ft. Worth.—Where a material witness for plaintiff testified to an alleged defect in a street, by which plaintiff claimed she was injured, and to his having repaired the same, but no foundation was laid for his impeachment, it was error for the court, after he had been excused from further attendance and had left the courthouse, to permit defendant to prove that the witness had declared that the work on the street, claimed to have been defective, was good.—Court of Civil Appeals of Texas, 155 S. W. R., 1182.

Salary of Mayor—Ordinance.

Browne v. City of Winchester et al.—Where an ordinance reducing the salary of the mayor of a city of the fourth class to \$500 was vetoed and never became operative by being passed over his veto, a pre-existing ordinance fixing the salary at \$1,200 remained in full force and effect.—Court of Appeals of Kentucky, 155 S. W. R., 1157.

Bids—Mistakes—Relief.

Abner M. Harper, Inc., v. City of Newburgh.—Plaintiff, intending to bid 90 cents per lineal foot for bluestone curbing and 65 cents for concrete curbing, put in a bid to defendant city in which the prices were transposed by mistake, and the city, without fraud, bad faith, or mutual mistake, accepted its bid for the stone curbing at 65 cents per lineal foot. Held, that plaintiff, under such circumstances and after the acceptance of its bid, was not entitled to a decree permitting it to rescind for mistake and recover its deposit.—New York Supreme Court, 139 N. Y. S., 1057.

Injuries to Employees.

Quackenbush v. Village of Slayton.—In an action brought against a municipality to recover damages for personal injuries received by a person while in its employ as a servant, and by reason of its negligent failure to discharge the duties of a master, section 768, Rev. Laws 1905, does not apply, either as to the service of written notice or as to the limitation of one year within which the action must be brought.—Supreme Court of Minnesota, 139 N. W. R., 716.

Street Paving Resolution—Sufficiency of Description.

Barber Asphalt Paving Co. v. Crist et al.—A street paving resolution declaring the intention of the City Council to order the construction of basalt block gutters of a certain width, upon a concrete foundation of a certain thickness, was not objectionable for failure to fix the thickness of the gutters; the term "basalt block" implying and being understood by reasonably intelligent men to mean blocks of sufficient size for the purpose intended.—District Court of Appeal, California, 130, P. R., 435.

Policeman—Insufficient Revenue—Discharge.

City of Shawnee v. Cotteral.—Where the revenues of a city are not sufficient to pay a policeman, the Council has the right to discontinue the office and relieve the incumbent from duty without preferring charges against him.—Supreme Court of Oklahoma, 130 P. R., 548.

Street Railroads—Regulation—Lighting Tracks.

Helena Light & Ry Co. v. City of Helena.—Rev. Codes provide that a City Council shall have power to require the lighting of any "railroad" track or route within the city, the cars of which are propelled by steam or otherwise, and fix the number, style, and size of lamp posts, burners, lamps, and all other fixtures and apparatus necessary for such lighting and the location of lamp posts, and require the construction of crossings on the line of any railroad track or route within the city, the cars of which are propelled by steam or otherwise, where the track inter-

sects or crosses any street, alley, or public highway, and determine and fix the kind of crossing and the grades, etc. Held, that the word "railroad" as used in such act, did not confer on the city the power to pass an ordinance requiring a street railroad company to light its tracks within the limits of the corporation without cost to the city.—Supreme Court of Montana, 130 P. R., 446.

Withholding Money from City.

Western Lumber & Pole Co. v. City of Golden et al.—Rev. St. 1908, providing that a city shall withhold money from a contractor of a public improvement and allow claims to be filed against the fund so held out, though providing no penalty for its disobedience, creates the city a trustee for the benefit of persons holding claims against the contractor; and if the city pay money to a contractor, contrary to the statute, claimants of the contractor can hold the city liable in an action for that purpose.—Court of Appeals of Colorado.

Defective Sidewalk—Grating.

City of St. James v. Stacy.—A grating extending nearly across a sidewalk was defective in that the edge of one of the sections was elevated above the other where they joined. Plaintiff, a cripple, who walked with crutches, was familiar with the grating and with its defective condition. On the occasion of his injury the sidewalk and the adjacent road were icy, and he undertook to cross the grating, in the way he had frequently done before, by getting a solid foothold as he approached it and then stepping or swinging over it on his crutches. In some manner he struck the end of one of his crutches against the elevated edge of one of the sections of the grating and fell and was injured. Held, that he was not guilty of contributory negligence as a matter of law.—United States Circuit Court of Appeals, 203 F. R., 35.

Exclusive Privileges—Municipal Competition.

Madera Water Works v. City of Madera, et al.—The property of a private water works company is not taken contrary to U. S. Const., 14th Amend., by the municipal construction of a competing plant, where there is no contract immunity from such competition, although the water works company may be forbidden by the local law to divert its property to other uses, and will be called upon to pay taxes to help its rival to succeed.—United States Supreme Court, 33 S. C. R., 571.

Waterworks Property—Rights Taxable.

Millville Water Co. v. Board of Equalization of Taxes of New Jersey et al.—In assessing the property of a waterworks company, it may be valued as a going concern, so long as the item of public franchise, which is taxable under the Voorhees Act, is not included. Right of a waterworks company to take water from the supply of a manufacturing company is taxable as a part of the water company's property.—Supreme Court of New Jersey, 86 A. R., 450.

Waterworks—Distributing System—Local Improvements.

Matthews et ux. v. City of Ellenburg et al.—Rem. & Bal. Code, authorizing any city to construct and operate waterworks within or without its limits to furnish water to its inhabitants and others, and providing for the submission to the voters of the question of so doing, empower a city to provide for the construction of a water supply system, and of a water distributing system, as complete independent systems, and an ordinance providing for the acquisition of a supply system may provide for a submission of the question to the voters, and the mere fact that it provides for the construction of an independent distributing system by local assessment on property specially benefited does not affect the validity of the adoption by the voters of the proposal to acquire a supply system. Under Laws 1911, providing that any local assessment may be initiated directly by the city council, by resolution declaring an intention to order the improvement, without submitting the question to the voters, a city may provide by resolution of its council for the construction of a water distributing system at the cost of the property specially benefited, without submitting the question to the voters.—Supreme Court of Washington, 131 P. R. 839.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS.

Highways, National. By C. H. Davis. Illustrated, 7 pp., Southern Good Roads, May, 10 cts.

Where Should the Money for Good Roads Construction be Spent? $\frac{1}{2}$ p., Engineering News, May 15, 15 cts.

Road Work, British. Illustrated, 3 pp., Good Roads, June 7, 15 cts.

Progress of State Highway Work in California. Illustrated, 2 pp., Good Roads, June 7, 15 cts.

Paving Work in Hamilton County, Tennessee. Illustrated, $5\frac{1}{2}$ pp., Good Roads, May 3, 10 cts.

Improving Desert Roads for Motor Truck Haulage. Illustrated, 1 p., Engineering News, May 29, 15 cts.

Road Work by Convict Labor in Colorado. Illustrated, 2 pp., Good Roads, June 7, 15 cts.

Building a Paved Roadway Across a Swamp. By James Owen. $1\frac{1}{2}$ pp., Contractor, May 1, 20 cts.

Instructions for Building State Aid Roads in Wisconsin. By A. R. Hurst. $1\frac{1}{2}$ pp., Engineering Contracting, May 7, 10 cts.

Use of Motor Trucks in Road Work. Illustrated, 5 pp., Good Roads, May 3, 10 cts.

Convict Labor in New Jersey. $\frac{1}{4}$ p., Municipal Journal, May 15, 10 cts.

Road Law Changes, Utah. $\frac{1}{2}$ p., Municipal Journal, May 8, 10 cts.

New Highway Law in Iowa. $\frac{2}{3}$ p., Good Roads, May 3, 10 cts.

Idaho's New State Highway Law. $\frac{1}{4}$ p., Municipal Journal, May 22, 10 cts.

Auto Trucks and Pavements. $\frac{3}{4}$ p., Municipal Journal, May 15, 10 cts.

Bonds on Roads, Super-elevation at. By Reginald Ryves. Illustrated, 3 pp., Surveyor, May 23, 40 cts.

By-Pass Roads. By Reginald Ryves. 2 pp., Surveyor, May 30, 40 cts.

Rocks, Petrographic Study of Road Building, in the United States Office of Public Roads. Illustrated, 1 p., Good Roads, June 7, 15 cts.

Macadam Construction in Illinois. $2\frac{1}{2}$ pp., Engineering & Contracting, May 28, 10 cts.

Bituminous Resurfacing by the Illinois Highway Commission. $1\frac{1}{2}$ pp., Engineering & Contracting, June 7, 10 cts.

Bituminous Gravel Concrete Road Surfaces. By J. W. Howard. Illustrated, $\frac{1}{2}$ p., Engineering & Contracting, June 7, 10 cts.

Bituminous Macadam Construction by The Illinois Highway Commission. $1\frac{2}{3}$ pp., Engineering & Contracting, May 28, 10 cts.

Asphaltic Macadam Construction on the Boulevard System of Kansas City. By G. W. Redpath. $2\frac{2}{3}$ pp., Engineering & Contracting, May 21, 10 cts.

Oiled Macadam for Residence Streets in San Bernardino. $\frac{1}{2}$ p., Engineering Record, May 24, 10 cts.

Bituminous Gravel Concrete Pavements. By S. J. Stewart. Illustrated, $3\frac{1}{2}$ pp., Southern Good Roads, May, 10 cts.

Bituminous Gravel Pavement Defects. Illustrated, $\frac{3}{4}$ p., Municipal Journal, May 29, 10 cts.

"Sticky" Tests for Bitumens. By C. B. Osborne. Illustrated, $1\frac{1}{2}$ pp., Good Roads, June 7, 15 cts.

Sheet Asphalt Surface, Highway Construction with Paint Binder and Report from California Highway Bulletin. By A. E. Loder. $\frac{2}{3}$ p., Engineering & Contracting, May 28, 10 cts.

Concrete Road Construction by Illinois Highway Commission. $\frac{1}{4}$ p., Engineering & Contracting, May 28, 10 cts.

Concrete Road Construction near Milwaukee. By H. J. Kuelling. 2 pp., Concrete-Cement Age, May, 15 cts.

Specifications of the Illinois Highway Commission on Concrete Road Construction. 1 p., Engineering & Contracting, May 7, 10 cts.

Surface Treatment of Concrete, Concrete Institute Committee's Reports. $1\frac{3}{4}$ pp., Surveyor, May 2, 40 cts.

Concrete Pavements Laid in 1912. 2 pp., Cement Era, May, 10 cts.

Some Defects of Concrete Paving. Illustrated, 1 p., Brick, June 1, 10 cts.

What Concrete Roads Cost in Illinois. 2 pp., Cement Era, June, 10 cts.

Experimental Road Work of the Public Roads Department of New Jersey. From report of R. E. Gage. 1 p., Engineering & Contracting, June 7, 10 cts.

Report on Experimental Pavements on the London-Folkstone Road, Kent, England. 2 pp., Good Roads, June 7, 15 cts.

Selection of Pavements, Scientific. Based on experience, expressed in figures, rather than on mere opinions or predilections; qualities of pavements classified under eleven heads, and values assigned to them. By W. W. Crosby. 2 pp., Municipal Journal, May 29, 10 cts.

Cost Figures of Four Concrete Roads. Illustrated, 1 p., Concrete-Cement Age, May, 15 cts.

Comparative Statistics on Cost of Road Construction. 2 pp., Engineering & Contracting, May 14, 10 cts.

Highway Costs, Communication from W. W. Crosby. $\frac{1}{4}$ p., Municipal Journal, May 8, 10 cts.

Classifying Road Expenditures, Methods of Maryland State Road Commission. $1\frac{1}{2}$ pp., Municipal Journal, May 15, 10 cts.

Culverts, Concrete. By F. H. McKechnie. Illustrated, 5 pp., Canadian Engineer, June 5, 15 cts.

Concrete Culverts in Grundy County, Missouri. Illustrated, $1\frac{1}{2}$ pp., Good Roads, May 3, 10 cts.

Definitions Proposed for Terms Used in Highway Work. By W. W. Crosby. 3 pp., Good Roads, May 3, 10 cts.

Photographs of Road Surfaces. Illustrated, 1 p., Municipal Journal, June 5, 10 cts.

Maintenance of Asphalt Pavements. Defects due to wear and tear of traffic, deterioration of bituminous material and defects in construction.—Repairing by cutting out and by surface heating. Abstract of paper before students of highway engineering, Columbia University. By F. P. Smith. 2 pp., Municipal Journal, May 15; 2 pp., May 22, 10 cts.

Highway Maintenance Costs in Foreign Countries. $1\frac{1}{2}$ pp., May 7, 10 cts.

Accounting in Ohio, Highway. $\frac{1}{4}$ p., Municipal Journal, May 29, 10 cts.

Administration in England, Road. $2\frac{1}{2}$ pp., Good Roads, June 7, 15 cts.

Pavements of London. By Reginald Ryves. Illustrated, $4\frac{1}{2}$ pp., Good Roads, June 7, 15 cts.

Additional Street Paving Data. $1\frac{1}{2}$ pp., Municipal Journal, May 22, 10 cts.

Brick and other Pavements after Ohio Flood. By G. Hopley. Illustrated, 4 pp., Brick, June 1, 10 cts.

Paving Brick Tests. Communication from J. R. Root. $\frac{1}{4}$ p., Municipal Journal, June 5, 10 cts.

Some Brick Paving Problems. Paper before American Society of Municipal Improvements. By J. E. Howard. Illustrated, 6 pp., Brick, May 15, 10 cts.

Brick Tests for Abrasion. Communication from Chas. J. Deckman. $\frac{2}{3}$ p., Municipal Journal, May 15, 10 cts.

Granite Block Pavements in Augusta, Georgia. Illustrated, 1 p., Good Roads, May 3, 10 cts.

Durax Pavement at the Brooklyn Navy Yard. By W. H. Allen. Illustrated, 1 p., Good Roads, June 7, 15 cts.

Asphalt Repairs, Cost of. By B. E. Briggs, City Engineer. $4\frac{1}{2}$ pp., Municipal Engineering, May, 25 cts.

Specifications for Pavements, Sidewalks and Curbing Approved by Na-

tional Association of Cement Users. 3 pp., Cement Era, May, 10 cts.

Sidewalk Improvement in New Haven. $\frac{1}{2}$ p., Municipal Journal, May 8, 10 cts.

Street Work in Spokane. Segregated unit costs obtained. Street cleaning by machine sweepers, flushers and hand sweeping. Operation of municipal repair plant. $2\frac{1}{4}$ pp., Municipal Journal, June 5, 10 cts.

Street Work in Passaic. By William Reid. $\frac{1}{2}$ p., Municipal Journal, May 22, 10 cts.

Work of the Philadelphia Bureau of Highways. Illustrated, $1\frac{1}{2}$ pp., Engineering Record, June 7, 10 cts.

Costs, Classifying Paving. $\frac{1}{2}$ p., Municipal Journal, May 22, 10 cts.

Inspectors of Street Paving of the Bureau of Highways, Borough of Manhattan, N. Y., General Instructions to. 2 pp., Engineering News, May 29, 15 cts.

5 pp., American City, June, 25 cts.

SEWERAGE AND SANITATION.

Sewerage System of Flint, Michigan. Illustrated, $1\frac{1}{2}$ pp., Engineering & Contracting, May 14, 10 cts.

Main Drainage of Gerrards Cross. Paper before Institution of Municipal and County Engineers. By Arthur Gladwell. $1\frac{1}{2}$ pp., Surveyor, May 2, 40 cts.

Construction Progress on Calumet Sag Canal. Illustrated, 5 pp., Contractor, May 1, 20 cts.

Pipe, Concrete Sewer, in Louisville. 1 p., Cement Era, May, 10 cts.

Testing Sewer Pipe. Illustrated, $\frac{1}{2}$ p., Municipal Journal, May 15, 10 cts.

Siphons, Sewer. Under New York Subway. Paper before Brooklyn Engineers Club. By T. L. Wilson. Illustrated, 6 pp., Municipal Engineering, May 25 cts.

Design of Siphon and Grit Chambers for the Main Intercepting Sewer, Fitchburg, Mass.. Illustrated, 3 pp., Engineering & Contracting, May 28, 10 cts.

Sewerage Siphons. $\frac{1}{4}$ p., Municipal Journal, May 8, 10 cts.

Storm Water Discharge, Problems of. Illustrated, 8 pp., Contract Record, May 14, 15 cts.

Discharge Diagram, A Sewer. By J. M. M. Greig. Illustrated, $1\frac{1}{2}$ pp., Canadian Engineer, June 5, 15 cts.

Pumping at Grand Rapids, Sewage. Illustrated, $\frac{1}{2}$ p., Municipal Journal, May 8, 10 cts.

Sewer Repairs in Erie. $\frac{1}{2}$ p., Municipal Journal, May 29, 10 cts.

Sewage Treatment. Paper before Institution of Municipal Engineers. By R. J. McKenn. 2 pp., Surveyor, May 9; $1\frac{1}{2}$ pp., May 15, 40 cts.

Sewage Treatment Works for Fitchburg, Mass.. By F. A. Marston. Illustrated, 5 pp., Engineering News, June 5, 15 cts.

Illustrated, 2 $\frac{2}{3}$ pp., Engineering Record, June 7, 10 cts.

Sewage Treatment at a State Hospital. By P. E. Mebus. Illustrated, $1\frac{1}{2}$ pp., Engineering Record, May 10, 10 cts.

Manufacture of Gas from Sewage Sludge. Illustrated, $\frac{1}{2}$ p., American Gas Light Journal, June 9, 10 cts.

Imhoff Tanks. Illustrated, 6 pp., Municipal Engineering, May, 25 cts.

Stream Pollution, Opinions Relative to. Digest of answers to series of questions prepared by Paul Hansen and distributed among sanitary engineers. 3 pp., Engineering Record, June 7, 10 cts.

Studies of Fish Life and Water Pollution. Paper before International Congress of Applied Chemistry. By H. W. Clark and G. O. Adams. 2 pp., Surveyor, May 30, 40 cts.

Regulations, House Drainage, on the Continent. Paper before Institute of Sanitary Engineers. By F. R. Durham. 3 pp., Surveyor, May 2, 40 cts.

Sanitary Legislation, Court Decisions. Milk Regulations. 8 pp., Public Health Reports, May 30.

Laws and Regulations Pertaining to Public Health, State. 12 pp., Public Health Reports, April 25; 10 pp., May 2; 10 pp., May 9; 6 pp., May 16; 4 pp., May 23; 6 pp., May 30; 8 pp., June 6.

Municipal Ordinances, Rules and Regulations Pertaining to Public Health. 14 pp., Public Health Reports, April 25; 7 pp., May 2; 9 pp., May 9; 14 pp., May 16; 14 pp., May 23; 8 pp., May 30; 13 pp., June 6.

Health Authorities of the United States, List of State and Insular. 10 pp., Public Health Reports, April 25.

Death Rates, Massachusetts. Illustrated, 1 p., Municipal Journal, May 29. 10 cts.

Plague in Porto Rico, Outbreak and Suppression of. By R. H. Creel. Illustrated, 25 pp., Public Health Reports, May 30. Illustrated, 31 pp., June 6.

Pure Food Victory Won by the Women of Grand Forks. By K. G. Leonard. Illustrated, 4 pp., American City, June 25 cts.

Baby-Saving Show, How an Instructive, Was Held in Wilkes-Barre for Less than \$200. By Stanley Freeman. 2 pp., American City, June 25 cts.

WATER SUPPLY.

Water Works of Niagara Falls. Both municipal and private plants, mechanical filtration, electrically driven turbine pumps. Illustrated, 4 pp., Municipal Journal, June 12. 10 cts.

Water works Statistics of American Cities. 9 pp., Municipal Journal, June 12. 10 cts.

Drinking Water in Industrial Plants. By John Sebroff. 3 pp., Industrial Engineering, June. 20 cts.

Water Works of Waverly, N. Y. Illustrated, 3/4 p., Municipal Journal, May 8. 10 cts.

Report of Milwaukee Water Works. By H. P. Bohmann, Superintendent. 2 pp., American Municipalities, June. 25 cts.

Key West Water Works. 1/4 p., Municipal Journal, June 12. 10 cts.

How to Improve or Conserve Your Public Water Supply. By G. W. Fuller. 3 1/2 pp., American City, June. 25 cts.

Water Works of San Diego. History of water supply of the city, reservoirs, conduit, tunnels, wood stave pipe, flumes, rock fill dams. Forest protection on the watersheds. Illustrated, 2 1/2 pp., Municipal Journal, June 12. 10 cts.

Vancouver's Water Supply. Illustrated, 3 pp., Contract Record, May 21. 15 cts.

Stream Flows, Snow Surveys for Predicting. By J. L. Alter. Illustrated, 4 pp., Engineering News, May 29. 15 cts.

Computing the Yield of a Water Shed. 4 pp., Engineering & Contracting, May 21. 10 cts.

Estimating the Amount of Evaporation from Water and Soil Surfaces in the Livermore Valley of California. From Report of T. W. Esty. 3 1/2 pp., Engineering & Contracting, May 7. 10 cts.

Artesian Water-Bearing Sands of Texas. Paper before Southwestern Water Works Association. By J. P. Powell. 1 1/4 pp., Fire & Water, May 14. 10 cts.

Pumping Station, Efficiency in the. Paper before Illinois Water Supply Association. By F. P. Pollard. 3 pp., Municipal Engineering, May. 25 cts.

Dam, Travelling Plant for Casting Concrete Blocks for Kensico. Illustrated, 2/4 p., Engineering Record, May 10. 10 cts.

Reservoir Walls, Repairs to Breaks in St. Louis. By E. E. Wall. Illustrated, 2/4 p., Engineering Record, May 24. 10 cts.

Construction of a Reinforced Concrete Reservoir at Fort Dodge. By T. C. Harding. Illustrated, 1 1/2 pp., Engineering & Contracting, May 21. 10 cts.

Cleaning a Reservoir Site. 1/2 p., Municipal Journal, June 12. 10 cts.

Failure of the Reservoir at Johnson City, Tennessee. By A. H. Purdue. Illustrated, 2/4 p., Engineering Record, May 31. 10 cts.

Water Tower, St. Louis. Illustrated, 1/4 p., Municipal Journal, June 12. 10 cts.

Aqueduct, Break in Los Angeles. 1/4 p., Municipal Journal, June 5. 10 cts.

Eight-Mile Concrete Conduit at Baker, Oregon. 1 p., Engineering Record, May 24. 10 cts.

Failure of the Sand Canon Inclined Pressure Tunnel, Los Angeles, Cal. By B. A. Heintz. 1/2 p., Engineering News, May 29. 15 cts. Illustrated, 2 1/2 pp., June 5.

Mains in Chicago, Cost of Constructing Water. 6 pp., Engineering & Contracting, May 14. 10 cts.

Interference with Pipes. Right of municipality to change locations of underground structures. By J. Simpson. 1 p., Municipal Journal, June 12. 10 cts.

Electrolysis, Lead Pipe Stops. 1/4 p., Municipal Journal, June 12. 10 cts.

Filtration Plant, Trenton's New. 1/4 p., Municipal Journal, June 12. 10 cts.

Uses and Abuses of Water Filtration. From paper before New England Water Works Association. By D. H. Pratt. 3 pp., Canadian Engineer, May 15. 15 cts.

Water Filtration Plant at North Vernon, Ill. From paper before Illinois Water Supply Association. By S. B. Severson. 1/4 p., Engineering & Contracting, June 7. 10 cts.

Wilmington, Delaware, Water Works. Preliminary filters, sedimentation reservoir and sand filters; bacterial and physical results and cost of operation. Illustrated, 2 1/2 pp., Municipal Journal, May 22. 10 cts.

Typhoid Fever at Albany, N. Y. Outbreak due to use of raw Hudson river water following flooding of filtration plant. By Theodore Hoffman. 7 pp., Public Health Reports, May 23. Illustrated, 2 1/2 pp., Engineering News, May 15. 15 cts.

Mechanical and Slow Sand Water Filtration. From paper before Canadian Public Health Association. By P. A. Murray. 1 p., Engineering & Contracting, May 7. 10 cts.

Rapid Water Filtration Plant at Saskatoon. Illustrated, 1 p., Engineering & Contracting, May 23. 10 cts.

Reports on Filtering the Croton Water Supply. 9 pp., Engineering News, May 22. 15 cts.

Settling Basin at Lexington. Construction and operation; some unusual features of design; use of coagulant and hypochlorite. By H. W. Southard. Illustrated, 2 pp., Municipal Journal, June 12. 10 cts.

Efficiency of Coagulating Basins. From paper before Illinois Water Supply Association. By W. F. Monfort. 4 pp., Canadian Engineer, May 8. 15 cts.

Purification of Water by Colloidal Clay. 2 pp., La Technique Sanitaire, May. 60 cts.

Sterilization of Water by Ultra Violet Light. By J. R. Davies. 2 pp., Chemical Engineer, May. 25 cts.

Sterilizing with Liquid Chlorine. Two months' experience at Somersworth, N. H. Illustrated, 1 1/4 pp., Municipal Journal, June 12. 10 cts.

The Elimination of Taste in Water Treated with Calcium Hypochlorite. Paper before Illinois Water Supply Association. By Arthur Lederer. 2 pp., Engineering News, May 8. 15 cts.

Emergency Installation of a Sterilization Plant in England. Illustrated, 1/2 p., Engineering Record, May 10. 10 cts.

Meters, Consumption and Rates. 1/4 p., Municipal Journal, June 12. 10 cts.

Water Meters in Houston. 1/4 p., Municipal Journal, June 12. 10 cts.

Water Meters in Wilmington. Importance of meter rates in effecting reduction of waste; "Readiness to serve" charge. 1/4 p., Municipal Journal, June 12. 10 cts.

Rates for the City of St. Louis. Study Made to Determine Equitable Water. 3 pp., Engineering & Contracting, May 28. 10 cts.

Madison Water Works Operation. Calculation of equitable rates for private consumers and the city, respectively; purchase of coal on the British thermal unit basis. 2 1/4 pp., Municipal Journal, June 12. 10 cts.

Waste in Kingston, Water. 1/4 p., Municipal Journal, June 12. 10 cts.

Leaks, Water Works. 1/4 p., Municipal Journal, May 22. 10 cts.

Effect of Artesian Water upon Galvanized Steel Pipe at Moline, Ill. 1 p., Engineering & Contracting, May 28. 10 cts.

Department of Water of San Diego, Cal. Organization of the. 2 pp., Engineering & Contracting, May 7. 10 cts.

Municipal Ownership of Water Works. Arguments advanced by council committee of Livingston, Montana. 1 1/2 pp., Municipal Journal, June 12. 10 cts.

Appraisal of Waterworks Properties. Paper before Illinois Water Supply Association. By D. A. Graham and D. H. Maurv. 1 1/2 pp., Engineering Record, May 10. 10 cts.

Pilot Tube, Origin and Theory of the. By A. E. Guv. Illustrated, 3 1/4 pp., Engineering News, June 5. 15 cts.

Association. Proposed New Constitution of the American Water Works. 1/4 p., Municipal Journal, June 12. 10 cts.

STREET LIGHTING AND POWER PLANTS.

Street Lighting, Specifications for. 1/2 p., Electrical World, May 10. 10 cts.

Standard Specifications for Street Lighting. 1/2 p., Engineering Record, May 31. 10 cts.

Development of Street Lighting in New York. Paper before New York Section of Illuminating Engineering Society. By C. F. Lacombe. 1 p., American Gas Light Journal, May 5. 10 cts.

Some Tendencies in Street Lighting. 1 p., Electrical Review, May 31. 10 cts.

White Way Lighting. 3/4 p., Electrical World, May 24. 10 cts.

Standard for St. Louis, Gas Lamp. Illustrated, 1/2 p., Municipal Journal, May 15. 10 cts.

Ornamental Concrete Lamp Posts. By H. G. Hall. Illustrated, 1 1/2 pp., Concrete-Cement Age, May. 15 cts.

The "Arrowhead" Street Light. Illustrated, 1/4 p., Municipal Journal, May 22. 10 cts.

Lamp, Development of New Quartz-Tube Mercury Arc. By E. Weintraub. Illustrated, 2 pp., Electrical World, May 10. 10 cts.

Municipal Lighting Plant for Cedar Falls. By C. M. Wyth. 1 1/2 pp., American Municipalities, June. 25 cts.

Pasadena's Municipal Light Plant. 1/2 p., Municipal Journal, May 29. 10 cts.

Yearly Report of Municipal Lighting Plant of Orange, N. J. 1 1/2 pp., Isolated Plant, June. 10 cts.

Chicago, Electrical Service in. Illustrated, 9 pp., Electrical World, May 31. 10 cts.

Rates, Electric Light and Power. By J. F. Ford. 3 pp., American Municipalities, June. 25 cts.

Meters, Automatic Device for Rating Current. By G. L. Stroebe. Illustrated, 1/4 p., Engineering News, May 22. 15 cts.

Accidents in Electric Light Corporations. Prevention of. Illustrated, 3 1/2 pp., Electrical World, May 10. 10 cts.

Classification of Protective Apparatus Used in High Voltage Lines. By B. E. Goodwin. Illustrated, 3 pp., General Electric Review, June. 20 cts.

Photometric Sub-Standard, A Convenient and Reasonably Accurate. Paper before Illinois Gas Association. By H. L. Farrar. 2 pp., American Gas Light Journal, May 19. 10 cts.

Gas Distribution in Toronto. By D. L. Hill. 2 pp., Canadian Engineer, May 8. 15 cts.

Automatic Lighting and Extinguishing of Street Gas Lamps. By J. A. Seager. Illustrated, 1 p., American Gas Light Journal, May 26. 10 cts.

Central Station Statistics for the State of Iowa. 1 p., Electrical World, May 17. 10 cts.

Inspection, Wisconsin Gas Service. By W. D. Pence. 2 1/4 pp., American Gas Light Journal, May 12. 10 cts.

Residuals, Gas Plant, Tar and Its by-Products. Paper before Southern Gas Association. By S. R. Church. 3 pp., American Gas Light Journal, May 26. 10 cts.

Convention of the National Electric Light Association. General account and abstract of paper. 31 pp., Electrical World, June 7. 10 cts.; 26 pp., Electrical Review, June 7. 10 cts.

Hydroelectric Plant, Keokuk, Iowa. The World's Largest. Illustrated, 14 pp., Electrical World, May 31. 10 cts.

Coal, Economy in Purchasing and Using. By A. O. Doan. 7 pp., Engineering Magazine, June. 25 cts.

FIRE DEPARTMENT.

Fire Department in Big New York Parade. Illustrated, 2 pp., Fire & Water, May 21. 10 cts.

Opposing Two Platoon System in Chicago. 1 p., Fire & Water, May 14. 10 cts.

Fire Marshal, Fire Chief vs. 2/4 p., Fireman's Herald, May 31. 5 cts.

Risk, Story of a Rotten, or the Triangle Fire. By A. E. McFarlane. 2 pp., Fire & Water, May 21. 10 cts.

Shingle Roof Evil, Wooden. Illustrated, 1 1/2 pp., Safety Engineering, April. 25 cts.

Incendiary Fires. Address before National Association of Manufacturers. By Joseph Johnson. Illustrated, 1 1/4 pp., Fire & Water, May 28. 10 cts.

Incendiary Work of Militant Suffragettes in England. Illustrated, 1 1/4 pp., Fire & Water Engineering, May 14. 10 cts.

Fires, Boston has a Trio of Three-Alarm, Simultaneously. Illustrated, 1 p., Fire & Water, May 21. 10 cts.

Apparatus, Triple Motor, Opinions of several fire chiefs for and against. Cost of operation in Newcastle. 1 p., Municipal Journal, May 15. 10 cts.

Chemical Fire Engines and Extinguishers. B. T. M. Burke. ½ p., Fireman's Herald, May 17. 5 cts.

Tractors for Fire Apparatus. Effectiveness and cost of operation in Passaic; use in New York; comparison with cost of horses. ½ p., Municipal Journal, May 8. 10 cts.

Testing Motor Engines. ½ p., Municipal Journal, May 15. 10 cts.

Maintaining Motor Fire Apparatus. ¼ p., Municipal Journal, May 22. 10 cts.

Progress of Motor Apparatus. By G. W. Booth. 1½ pp., Fireman's Herald, May 17. 5 cts.

Cost and Service Comparison of Motor Trucks and Horse-Drawn Vehicles. 1½ pp., Engineering & Contracting, May 14. 10 cts.

Motor Tire Wearing, Various Cities. 2 pp., Municipal Engineering, May. 25 cts.

Tests of New York Convention. Final statements of conditions issued. 1 p., Fireman's Herald, May 17. 5 cts.

Hydrant, Boston's New High-Pressure Fire. Illustrated, 1 p., Engineering Record, June 7. 10 cts.

Fire Streams from Small Hose and Nozzles. Paper before Illinois Water Supply Association. By V. R. Fleming. Illustrated, 2 pp., Engineering Record, May 10. 10 cts.

Fire Alarm Telegraph. What the central office does and how. By H. C. Wright. Illustrated, 1½ pp., Fireman's Herald, May 10. 10 cts.

GOVERNMENT AND FINANCE.

Government, Should Canadian Cities Adopt Commission. By W. B. Monroe. 2 pp., Municipal World, May. 15 cts.

Roman Government in Caesar's Time, with Modern Contrasts. Address before City Club of Chicago. By S. R. Fuller. 6 pp., Bulletin, May 2.

Laws, New Iowa Municipal. 2 pp., American Municipalities, June. 25 cts.

Public Works Department Organization, A Year's Experience with the Boston. Illustrated, 2 pp., Engineering News, May 22. 15 cts.

Public-Utility Corporations, Regulation of, by Commission Electric Companies 3 pp., Electrical Review, May 31. 10 cts.

State Regulation of Public Utilities. Is only a return to old common law methods of control. By W. L. Huggins. 2 pp., Public Service, May. 20 cts.

The Regulation of Public Utilities in Wisconsin. By Halford Erickson. 3 pp., Public Service, May. 20 cts.

Utility Commissions for Missouri and Maine. 1 p., Public Service, May. 20 cts.

Depreciation and Public Service Regulation. By R. H. Whitten. 6 pp., Engineering News, May 8. 15 cts.

Rules for the Protection of Electric-Service Employees: an Order of the New York Public Service Commission (First District). ¾ p., Engineering News, May 29. 15 cts.

City Purchasing in Cincinnati. City purchasing agent's office, forms used for authorizing, making and recording purchases. By W. G. Stiegler. Illustrated. 2½ pp., Municipal Journal, May 8. 10 cts.

Bond Market, The Municipal. ¼ p., Municipal Journal, June 5. 10 cts.

Assessment Laws, Illinois Special. ¼ p., Municipal Journal, May 29. 10 cts.

Assessment of Real Estate. Report of the Committee of the Fifth National Conference on State and Local Taxation. 3 pp., Canadian Municipal Journal, May. 15 cts.

Land-Tax System of Benefit Assessments for Public Improvements in Kansas City, Mo. Paper before City Planning Conference. By George Kessler. ½ p., Engineering News, May 15. 15 cts.

Financed, How the Parks and Boulevards of Kansas City are. From paper before Fifth National Congress on City Planning. By G. E. Kessler. Illustrated. 6 pp., The American City, June. 25 cts.

Efficiency Records, Merit System of. ¼ p., Municipal Journal, May 8. 10 cts.

Work of the Efficiency Division, Chicago Civil Service Commission. 2 pp., Engineering Record, June 7. 10 cts.

REFUSE DISPOSAL.

Collection and Disposal of Boston Refuse. Illustrated, 4 pp., Engineering Record, May 10. 10 cts.

Municipal Refuse Collection. Paper before Civil Engineers' Society of St. Paul. By G. H. Herrold. ¾ p., Engineering & Contracting, May 14. 10 cts.

Ash Hauling in St. Louis. ½ p., Municipal Journal, June 5. 10 cts.

Rubbish Cans Furnished by Cities. By A. L. Bostwick. 1 p., Municipal Journal, June 5. 10 cts.

"Spring Clean-up" for New York City. 11 pp., Bulletin, Department of Health, New York. March.

Street Cleaning in Europe, Notes on. 1 p., Municipal Journal, May 29. 10 cts.

Refuse Destructor at Smethwick, Test of a. By W. Naylor. Illustrated, 3 pp., Surveyor, May 23. 40 cts.

TRAFFIC AND TRANSPORTATION.

Traffic Census on Highways. By L. I. Hewes. 1 p., Engineering Record, May 17. 10 cts.

Recent Startling Aspects of the Traction Question. Address before City Club of Chicago. By G. C. Sikes. 6 pp., Bulletin, May 2.

Transportation Facilities and City Planning. Paper before City Planning Conference. By M. R. Maltbie. 1 p., Engineering News, May 15. 15 cts.

American Cities Lead in Transportation. ¼ p., Municipal Journal, May 29. 10 cts.

Track Elevation at Joliet, Ill. Illustrated, 3½ pp., Engineering News, May 8. 15 cts.

Grade Crossing Costs. Illustrated, ½ p., Municipal Journal, May 22. 10 cts.

Track Elevation on the Chicago, Milwaukee and St. Paul Railroad at Chicago. By R. J. Middleton. 2 pp., Contractor, June 1. 20 cts.

Trolley Wire, Suspension of, from Buildings. By L. A. Dumond. Illustrated, 2 pp., Municipal Engineering, May. 25 cts.

Motor Truck Efficiency. Illustrated, 2 pp., Municipal Engineering, May. 25 cts.

Conditions of Motor Truck Economy. Paper before Engineers' Society of Western Pennsylvania. 2 pp., Municipal Engineering, May. 25 cts.

Cost of Hauling with Tractor Outfits on Illinois Road Construction. ½ p., Contractor, June 1. 20 cts.

Cost of Operating Auto Trucks. ½ p., Municipal Journal, May 29. 10 cts.

Valuation, Street Railway. 4½ pp., Engineering News, May 22. 15 cts.

STRUCTURES AND MATERIALS

Concrete, Method of Proportioning. By W. B. Hunter. Illustrated, 2 pp., Engineering News, May 8. 15 cts.

Effect of Too Much Water in Mixing Concrete. ¾ p., Engineering News, May 22. 15 cts.

Cement, Steel Bridge Protected with. Illustrated, ¼ p., Municipal Journal, May 15. 10 cts.

Paints, Test of Red-Lead Priming. By C. M. Chapman. Illustrated, 2 pp., Engineering News, May 8. 15 cts.

Tar from Continuous Vertical Retorts. Paper before British Society of Chemical Industry. By T. Stenhouse. 1 p., American Gas Light Journal, May 19. 10 cts.

Bridge in Los Angeles, Concrete. Illustrated, ¾ p., Municipal Journal, June 5. 10 cts.

Colorado Street Bridge over Arroya Seco. By E. E. Howard. Illustrated, 2 pp., Engineering Record, May 24. 10 cts.

Atherton Avenue Highway Bridge, Pittsburgh. Illustrated, 2 pp., Engineering Record, May 17. 10 cts.

Suspension Bridges and Cantilevers. By D. B. Steinman. 1½ pp., Engineering Record, May 24. 10 cts.

City Waterway Bridge, Tacoma, Washington. Illustrated, 1 p., Engineering News, May 15. 15 cts.

Comparative Study of Limiting Span, Maximum Span and Economic Span for Suspension Bridges and Cantilever Bridges. By D. P. Steinman. Illustrated, 4½ pp., Engineering & Contracting, May 7. 10 cts.

Peru Concrete Bridge in the Eastern Flood. By D. B. Luten. Illustrated, 2 pp., Good Roads, June 7. 15 cts.

Beams, Bending Moments in Continuous Reinforced-Concrete. By S. E. Thompson. 1½ pp., Engineering Record, June 7. 10 cts.

Pier, Commonwealth, Boston. Largest passenger pier in the country; general plan of structure; contractors' methods. Illustrated, 3½ pp., Municipal Journal, June 5. 10 cts.

Building Heights, Limiting. ¼ p., Municipal Journal, May 29. 10 cts.

MISCELLANEOUS.

City Planning as a Civic Asset. By G. R. Taylor. 2 pp., Survey, May 31. 10 cts.

Planning of City Streets. Paper before Engineers' Club of Philadelphia. By B. A. Haldeman. 2 pp., Engineering & Contracting, May 14. 10 cts.

Scientific City Planning. Paper before Fifth National Conference on City Planning. By G. B. Ford. 1½ pp., Engineering & Contracting, May 14. 10 cts.

The City Scientific. Paper before National Conference on City Planning. By G. B. Ford. 1½ pp., Engineering Record, May 17. 10 cts.

Plans for the Development of a Tract on the Outskirts of a Growing City. Report from National Conference on City Planning. Illustrated, 3 pp., The American City, June. 25 cts.

Organization and Functions of a City Planning Commission. Paper before City Planning Conference. By W. A. Magee. ¾ p., Engineering News, May 8. 15 cts.

The Utilization of Streets. By R. J. Harding. Illustrated, ½ p., Municipal Journal, May 29. 10 cts.

Jones Falls Improvement at Baltimore. Illustrated, 2 pp., Contractor, May 15. 20 cts.

Jones Falls Boulevard. Illustrated, 3 pp., Cement Era, May. 10 cts.

Park System, Chicago's. Address before City Club of Chicago. By G. T. Buchingham and E. B. DeGroot. 5 pp., Bulletin, May 2.

Improving Providence Mall. By W. M. Strong. Illustrated, ½ p., Municipal Journal, May 8. 10 cts.

Picnic Stoves in Reading. Illustrated, ½ p., Municipal Journal, May 8. 10 cts.

Recreation, How to Aid the Cause of Public. By H. S. Braucher. 5 pp., The Playground, June. 25 cts.

Public Recreation and Parks. Paper before League of Washington Municipalities. By R. W. Cotterill. Illustrated, 2½ pp., Pacific Builder & Engineer, May 24. 20 cts.

Opportunity of the Department for Recreation in Boston, Mass. 3 pp., The Playground, June. 25 cts.

Swimming Bath at Southampton, Concrete. By J. A. Crowther. Paper before Institution of Municipal and County Engineers. Illustrated, 1 p., Canadian Engineer, May 8. 15 cts.

Drinking Fountains, Cost of Ice Water. ¼ p., Municipal Journal, May 22. 10 cts.

City Forestry Methods in a New England City. By W. W. Colton. Illustrated, 5 pp., American City, June. 25 cts.

Pulling Small Trees with a Traction Engine. By G. Hutchinson. ½ p., Engineering & Contracting, May 7. 10 cts.

To Secure Reforestation. ½ p., Municipal Journal, May 22. 10 cts.

Market House for Chattanooga. ½ p., Municipal Journal, May 15. 10 cts.

Municipal Market Buildings in the Philippines. By J. R. Arnold. Illustrated, 5 pp., American City, June. 25 cts.

Des Moines New Market. ¼ p., Municipal Journal, June 5. 10 cts.

Library, Chicago Municipal Reference. ¼ p., Municipal Journal, May 15. 10 cts.

Municipal Reference Libraries. ¾ p., Municipal Journal, June 5. 10 cts.

Advertising Mediums, City Structures. as. ¼ p., Municipal Journal, June 5. 10 cts.

Posts, Concrete Sign and Telegraph. Illustrated, ¼ p., Municipal Journal, June 5. 10 cts.

Letter Boxes to be Printed Dark Red. 2 pp., Safety Engineering, April. 25 cts.

Waterfront Works at Toronto, Ont. New Harbor and. Illustrated, 3 pp., Engineering News, May 29. 15 cts.

Flood and Cyclone, Lessons from. Too many utility companies operate under fair weather rates. By W. F. Brashears. Illustrated, 2½ pp., Public Service, May. 20 cts.

Preliminary Report on Straightening of Cuyahoga River. Illustrated, 1 p., Engineering Record, May 17. 10 cts.

Relation of the Proposed Pittsburgh Flood Reservoir System to Navigation. 2 pp., Engineering Record, May 10. 10 cts.

NEWS OF THE SOCIETIES

Calendar of Meetings.

June 24-26.

SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION.—Annual Meeting, Minneapolis, Minn. H. H. Norris, Secretary, Cornell University, Ithaca, N. Y.

June 23-27.

AMERICAN WATER WORKS ASSOCIATION. Thirty-third Annual Meeting, Minneapolis, Minn. John M. Diven, Secretary, 47 State street, Troy, N. Y.

June 23-28.

INTERNATIONAL ROADS CONGRESS.—Third Congress, London, England. W. Rees, Jeffreys Secretary, Queen Anne's Chambers, Broadway, Westminster, London, S. W.

June 24-26.

UNION OF TEXAS CHIEFS OF POLICE AND CITY MARSHALLS.—Annual Convention Galveston, Tex.—Hollis Baum, Chief of Police, Waco, President.

June 24-26.

SOUTH CAROLINA STATE FIREMEN'S ASSOCIATION.—Annual Convention, Abbeville, Chief Elgin, Abbeville, S. C.

June 24-28.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Annual Convention, Atlantic City, N. J. Edgar Marburg, Secretary, University of Pennsylvania, Philadelphia, Pa.

June 27-29.

LOUISIANA STATE FIREMEN'S ASSOCIATION.—Eighth Annual Convention, Opelousas.

July 8-10.

INDIANA LEAGUE OF MUNICIPALITIES.—Annual Convention, Gary. A. P. Melton, Secretary, Gary.

July 15-17.

UNION OF CANADIAN MUNICIPALITIES.—Thirteenth Annual Convention, Saskatoon, Sask. W. D. Lighthall, Hon. Secretary-Treasurer, 305 Quebec Bank Bldg., Montreal, Canada.

July 21-26.

IOWA STATE FIREMEN'S ASSOCIATION.—Annual Convention, Perry.

July 22-25.

LEAGUE OF WISCONSIN MUNICIPALITIES. Annual Convention, Neenah, Wis.

August 5-8.

NEW YORK STATE FIREMEN'S ASSOCIATION.—Annual Convention, Brockton.

August 19-22.

INTERNATIONAL ASSOCIATION OF MUNICIPAL ELECTRICIANS. — Eighteenth Annual Convention, Watertown, N. Y.

August 25-30.

FOURTH INTERNATIONAL CONGRESS ON SCHOOL HYGIENE, Buffalo, N. Y. Dr. Thomas A. Storry, Secretary General, College of the City of New York.

August 26-28.

CENTRAL STATES WATER WORKS ASSOCIATION.—Seventeenth Annual Meeting, Cedar Point, O.—R. P. Bricker, Secretary, Shelby, O.

September 1-6.

INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS. Forty-first Annual Convention, Grand Central Palace, New York City. James McFall, Secretary, Roanoke, Va.

September 9-13.

AMERICAN PUBLIC HEALTH ASSOCIATION.—Annual Convention, Colorado Springs, Col.—S. M. Gunn, secretary, 753 Boylston street, Boston, Mass.

September 10-12.

NEW ENGLAND WATER WORKS ASSOCIATION.—Annual Convention, Philadelphia, Pa. Willard Kent, Secretary, Narragansett Pier, R. I.

September 29-October 4.

AMERICAN HIGHWAY ASSOCIATION.—Annual Convention, Detroit, Mich. J. E. Pennybacher, Secretary, Washington, D. C.

October 7-10.

AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS.—Twentieth Annual Meeting, Wilmington, Del.—A. Prescott Folwell, Secretary, 50 Union Square, New York City.

November 10-15.

UNITED STATES GOOD ROADS ASSOCIATION.—Meeting St. Louis, Mo. John H. Bankhead, president; J. A. Rountre, secretary, 1021 Brown-Marx Building, Birmingham, Ala.

December 9-12.

AMERICAN ROAD BUILDERS' ASSOCIATION.—Annual Convention, First Regiment Armory, Philadelphia, Pa. E. L. Powers, Secretary, 150 Nassau street, New York City.

Association of Mayors and Other City Officials of the State of New York.

The fourth annual conference was held in Binghamton, June 5-7, and the program as announced in the Municipal Journal, June 12, page 836, substantially carried out. Headquarters for the visitors were established in the mayor's office, where Secretary W. P. Capes received the delegates and distributed badges and tickets. Among those who registered were:

Thos. H. O'Neill, mayor, Auburn; Frederick H. Waldorf, mayor, New Rochelle; Stuart F. Douglas, councilman, New Rochelle; F. C. Koch, councilman, New Rochelle; C. D. Hoard, Ogdensburg; D. N. Mulligan, Ogdensburg; Thos. Dineen, Ogdensburg; T. P. C. Barnard, health officer, No. Tonawanda; W. H. Frank, mayor, Poughkeepsie; J. J. McDermott, alderman, Poughkeepsie; V. M. Collins, alderman, Poughkeepsie; P. J. Hayden, alderman, Poughkeepsie; Wm. Baker, alderman, Poughkeepsie; Chas. S. Owen, commissioner public safety, Rochester; H. W. Pierce, commissioner public works, Rochester; B. J. Hagerty, secretary to mayor, Rochester; A. M. Flannery, D. P. S., Rochester; J. B. Corwin, mayor, Newburgh; D. Murphy, Hornell; J. O. Hammit, secretary Citizens Union, New York City; Frank J. Baker, mayor, Utica; William R. Plaatz, deputy tax commissioner, New York; Geo. M. Fanning, city attorney, Fulton; J. E. Boland, Fulton; S. E. Townsend, mayor, Rome; Ray Armstrong, superintendent water department, Rome; N. H. Jones, Rome; A. R. Kessinger, Rome; Edwin W. Fiske, mayor, Mt. Vernon; Frank A. Bennett, corporation counsel, Mt. Vernon; R. F. Keator, chief of police, Corning; Jas. T. Howard, city clerk, Corning; W. O. Drake (city engr.), superintendent public works, Corning; F. S. Swain, M.D., health officer, Corning; Thos. Dransfield, city clerk; Rochester; N. H. Maider, city attorney, Gloversville; A. L. Johnson, M.D., health officer, Gloversville; W. F. Judson, New York City; John Nadge, alderman, Ithaca; Albert Morris, Oneonta; C. H. Baker, Oneonta; F. D. McGaugh, alderman, Cortland; N. D. Comerford, alderman, Cortland; Fred Hatch, city attorney, Cortland; F. M. Kinsman, alderman (pres.), Cortland; E. L. Becker, superintendent public works, Cortland; Geo. R. Fearon, alderman, Syracuse; C. P. Gurman, alderman, Syracuse; P. J. Cawley, alderman, Syracuse; John J. Monaghan, city clerk, Lackawanna; M. J. Carey, 2d Ward councilman, Lackawanna; P. A. McGovern, Lackawanna; Geo. A. Brock, mayor, Lockport; S. B. Patten, superintendent of streets, Lockport; W. P. Coppersmith, Rome; W. F. Boylan, Rome; H. C. Allen, city engineer, Syracuse; F. M. Westcott, commissioner public works, Syracuse; M. E. Monahan, comptroller, Syracuse; E. J. McInerney, Syracuse; E. B. Darron, Syracuse; V. H. Clymer, Syracuse; Wm. J. Apps, alderman, Syracuse; C. A. Wolfarth, alderman, Syracuse; E. D. Very, sanitary engineer, D. S. C., New York City; H. C. Midlam, commissioner public works, Rome; T. J. Mowry, president commissioner public works, Rome; Geo. E. Darlington, commissioner public works, Rome; Geo. H. Ball, alderman, Olean; J. J. Sullivan, alderman, Olean; J. J. Fleming, commissioner public works, Yonkers; W. H. Dennin, comptroller, Troy; Otto Pfaff, mayor, Oneida; Chas. C. Duryee, Schenectady; Wm. P. Gregg, corporation counsel; Port Jervis; E. G. Cuddeback, M.D., health officer, Port Jervis; R. J. Harding, consulting engineer, Poughkeepsie; C. T. White, tax commissioner, New York City; J. G. Wall, tax commissioner, New York City; Andrew Spencer, ex-mayor, Albany; A. E. Ceperley, alderman, Oneonta; J. O. Coy, alderman, Oneonta; S. A. Desbrow, alderman, Oneonta; G. B. Baird, chairman fire commissioners, Oneonta; H. H. Crum, M.D., health officer, Ithaca; H. L. Stewart, assistant superintendent public works, Ithaca; B. B. Burritt, A. I. C. P., New York City; W. O. Kerr, city clerk, Ithaca; E. W. Sylvester, city engineer, Poughkeepsie; H. B. Spoul, Peekskill; J. H. Dealy, mayor, Amsterdam; C. B. Lester, Albany; H. J. Ball, health officer, Cortland; T. T. Buck, pres., common council, Olean; E. A. Powers, Olean; R. McGavish, Olean; Cy. J. Miller, president Borough Bronx, New York City; A. E. Bailey, alderman, Olean; J. H. Gayner, alderman, Olean; Edw. J. Cordial, president, council, New Rochelle; A. Gerritzen, city clerk, New Rochelle; W. A. Rill, president council, Syracuse; Michael Danaher, corporation counsel, Elmira; Ossian Lang, president board alderman, Mt. Vernon; O. J.

Dempster, city engineer, Little Falls; C. Reardon, alderman, Little Falls; John Sayles, secretary mayor, Buffalo; J. J. O'Hara, Corning; E. B. Jones, Elmira; Fred B. Davis, Utica; C. M. Quinn, M.D., health officer, Mt. Vernon; E. H. Coddling, M.D., health officer, New Rochelle; John J. Irving, Binghamton; W. H. Angell, Cortland; Daniel Shehan, Elmira; Alden J. Henry, Gloversville; Louis Van Hoesen, Hudson; Wm. H. Nearpass, Port Jervis; Samuel A. Carlson, Jamestown; Robert H. Reed, Lackawanna; George R. Lunn, Schenectady; Frank Shall, Little Falls; Rosslyn M. Cox, Middletown; Cornelius F. Burns, Troy; J. B. Corwin, New Troy; Peter C. Foley, Olean; Wm. H. Frank, Poughkeepsie; James T. Lennon, Yonkers.

After welcoming the city officials to Binghamton, Mayor Irving said the mayors' conference is past the experimental stage and is now well organized and a genuine working body in the interests of the municipalities of the state. The first two years of the conference were devoted to organizing it thoroughly and placing it on a good financial basis. After that had been accomplished the conference during the last year devoted its efforts to constructive work in the interest of the municipalities which in one year resulted in the passage of the municipal empowering act which is the first achievement in the campaign for genuine home rule. It also succeeded in having placed on the statute books a city planning law. These two laws are exceedingly important to the cities of the state.

Mayo Fester, describing the home rule legislation of Ohio, said: "We have reversed the presumption that a city can exercise only such powers as are granted by the general assembly and have established the principle that a city may exercise all powers not specifically prohibited and that prohibition is limited to powers general in nature."

Thomas Carmody explained New York's new home rule law. He said that "the enumeration of specific powers is broad and covers almost all the powers now vested in any of the cities of the state. It would be impossible to enumerate all these powers. The section (No. 20) does not undertake to do so, but rather sums them up under appropriate heads, the intention being apparently to confer upon all cities of the state such powers as it is proper for cities to possess and exercise in respect to their own affairs, a portion of which some cities now have and none of which all cities have. Heretofore the rule of construction in respect to powers granted cities by the legislature was that all powers not granted are withheld. These provisions all intended to reverse that rule and to provide that all powers not withheld are granted."

William P. Capes outlined a program for a state-wide municipal welfare movement. He would have the mayor of a city initiate the movement by appointing committees to arrange a six-day program for the discussion of the six important branches of municipal welfare. He would have one day a discussion of each of the following factors in urban life: moral, educational, industrial, commercial, civic and social.

Commissioner Edwards, New York, speaking of street cleaning, emphasized the necessity for the head of every

street cleaning department to show a human interest in the work of the men, if he really wants to raise the standard of efficiency. He advocated the establishment of a pension fund, saying that such a system instills into the men a keen desire to do better work and to conduct themselves so that they will not be dismissed from the service. He also pointed out that the system permitted the commissioner to retire men who are no longer able to do good work and put younger and more active employees in their place.

Nelson P. Lewis, New York, in a paper on street paving, divided streets into six classes and indicated the kinds of pavements which were suitable for each. He emphasized the importance of sane financing, that is, in issuing bonds for pavements to run for a length of time corresponding to the probable life of the pavement.

Mayor Schoeneck was made chairman of the council of five which is to administer the central bureau of municipal information, to be established at Albany. It will be operated in conjunction with the state library. The other members of the council are Mayors Louis Van Hoesen, Hudson; Abraham Harrison, Johnstown; Samuel A. Carlson, Jamestown, and W. Irving Griffing, Glens Falls.

Cyrus C. Miller, New York, speaking of markets, said that a city could reduce the cost of living by providing terminal markets, by supervising and inspecting the marketing, so that the interests of all are safeguarded; by giving publicity to market conditions, so that the people can market more intelligently, and by aiding nearby farmers to improve productions and to market their goods advantageously.

A discussion of Sunday baseball was left unfinished, and a resolution passed to submit the matter to a referendum vote to be recorded in writing.

Dr. Talcott Williams spoke on the relation of the newspaper to city affairs. He thought hurried work was the cause of many of the inaccurate statements in papers about city affairs and urged that city officials take the time to give out careful, accurate and complete information.

Daniel T. Turner spoke on transportation and city plans. He advocated municipal ownership and private operation as the only rational solution of the municipal transportation system.

Among the resolutions adopted were the following:

Freeing from taxation structures built and used in connection with municipal water supplies.

Protesting against giving poor law officers authority over admission of patients to public hospitals other than almshouse hospitals.

Urging city, village and town authorities to take advantage of the new public health and vital statistics laws.

Recommending the appointment of a committee on standardizing methods of establishing tax assessments.

International Association of Police Chiefs.

The twelfth annual convention was opened at the Raleigh Hotel, Washington, June 9. The convention was called to order by Major Richard Sylvester, president. Commissioner Johnston, Washington, made the address of welcome. D. J. Callahan, president of the Chamber of Commerce, in a welcoming address, stated that the Washington department was free of politics and graft. Major Sylvester in his annual address spoke principally of the means of preventing crime. Referring to identification systems, he said that representatives of German cities recently meeting in Berlin agreed to eliminate the metric method, except for international use, and to adopt the dactyloscopic or finger print method, which they believed would eventually prevail throughout the world. Referring to this country, Major Sylvester said that a method of identification is not a system until it is adopted by every municipality maintaining a police force. Photography was referred to as an important adjunct in police work. The use of photographs showing traffic conditions as a means of studying causes and working out remedies was a comparative novelty in the traffic police department. Advances in apparatus for humane restraint, folding litters, batons, etc., were referred to.

M. A. Pinkerton, Chicago, read a paper on "Do Paroles Work for Betterment?" He declared political influences should be eliminated from the conduct of all penal institutions, and more especially from all boards of pardon or parole. He declared the indeterminate sentence and parole law cannot be efficiently administered in any prison controlled by partisan politics, for the most important part of the indeterminate sentence and parole law is its supervision.

Causes of the social evil and methods of suppressing it were the subjects of discussion at one session.

John L. Beavers, Chief of Police of Atlanta, Ga., advocated the elimination of the social evil in this country. He told of the cleaning up of the segregated district of Atlanta eight months ago, and declared that since it had been cleaned up there was less crime in that city. Most of the police department heads favored the segregated district, as opposed to an attempt at total suppression. Chief Peterson, Oakland, Cal., declared that the granting of suffrage to women had added a complicating element to the social question in California. "The women, with their diversified opinions, their sentimentalism and their desire to shine socially have seriously handicapped the work in the city which I represent," he declared. "The women are actuated by the best of motives and they are sincere to the very bottom of their hearts, but they lack the ability to look at conditions in the light which men do and which they should. The women are in favor of immediate and absolute elimination, and that is where the trouble lies." William Copeland, Chief of Police of Cincinnati, said the problem appeared to him to be without solution, but added that between elimination and segregation the latter was preferable, in his opinion.

"Police Pensions and Retirement" was the subject of a paper by J. J. Downey, Chief of Police of Detroit, Mich. He described the system now in operation in Detroit and said that in many cities there was a vast difference in the amounts which privates and officers received. He said that this was



Courtesy Binghamton Press.

MEMBERS OF MAYORS' CONFERENCE, BINGHAMTON, N. Y., JUNE 5, 1913.

unjust and that the pension of the disabled private should be almost if not quite as great as that of the pensioned Chief of Police.

Joseph M. Quigley, Chief of Police of Rochester, N. Y., presented an interesting paper, in which he declared crime had decreased slightly throughout the nation during the four years ended in 1912.

"Uniformity of Police Attire, Equipment and Statistics" was the subject of a paper presented by Wentworth E. Griffin, Chief of Police of Kansas City, Mo. He advocated the wearing of white gloves by policemen throughout the country. He told of the evolution of the police uniform, explaining that those used in the United States were designed for utility rather than for display.

Chief Behrend, Lansing, Mich., spoke on the drug habit among boys. He said that the frequency with which it is found among the youths of the city is alarming. "So rapidly has the use of drugs increased among boys in recent years," he said, "that now the habit threatens to completely annihilate the vitality of young manhood."

George S. Dougherty, Deputy Commissioner of Police of New York City, told of the use of motor vehicles in the Police Department. He declared they had proven satisfactory and that many more have been ordered for use in his department.

Other papers read at the sessions were: "Canal Zone Police," written by C. W. Barber, Chief of Police of the Canal Zone, and read by Lieut. Arthur Kennedy; "Shall Moving Picture Theatres Close on Sunday?" by J. N. Tildard, Chief of Police of Altoona, Pa.

National Association of Comptrollers and Accounting Officers.

The eighth annual convention was held in Chattanooga, June 5-7. The opening session was addressed by Mayor Thompson and F. E. Mahoney on behalf of the city, to welcome the visitors. The response was by W. G. Justice, comptroller of Buffalo. President Wilhite, Louisville, in his address, said that the society had on its roster about 125 individuals and about 90 cities and states.

The following papers were presented: "Commission Form of Government," the Hon. T. C. Thompson, mayor of Chattanooga, Tenn.; "Proper Accounting for Fixed Assets of Municipalities," the Hon. John E. Traeger, comptroller, Chicago, Ill.; "New Sources of Municipal Revenue and the Financing of Municipal Activities," Robert S. Binkerd, secretary City Club, New York City; "Segregated Budget vs. Lump Sum Appropriations," Dr. Frederick A. Cleveland, chairman President's Commission on Economy and Efficiency; "Common Efficiency Standards for City Administration," Henry Bruere, director Bureau of Municipal Research, New York City; "Municipal Statistics," the Hon. Dan. S. Brown, comptroller, Minneapolis, Minn.; "Collection of Arrears of Taxes and Assessments—New

York's Law and How It Operates," the Hon. William A. Prendergast, comptroller, New York City; "Municipal Assets," Thomas E. Turner, public accountant, Louisville, Ky.

The officers elected were: President, Samuel M. Wilhite, comptroller of Louisville, Ky.; first vice-president, W. G. Justice, comptroller of Buffalo, N. Y.; secretary, George M. Rex, certified public accountant of Providence, R. I.; treasurer, Duncan MacInnis, chief accountant of the Department of Finance, New York City; vice-presidents, Chas. O. Beaver, Chattanooga; W. S. Cook, New Bedford, Mass.; A. H. Muir, Kingston, Ont.; J. S. Culpepper, Norfolk, Va.; F. E. Gunn, St. Louis; Thos. F. Boyle, San Francisco; John Eisman, Detroit; B. M. Townsend, Atlantic City, N. J.; Louis Kotecki, Milwaukee; Edward S. Osborne, Rochester, N. Y.; John E. Traeger, Chicago; LeGrand Powers, Washington, D. C.

Milwaukee was chosen as the next meeting place.

The social features of the meeting included automobile rides to Chicamauga Park and Signal Mountain.

The following is a list of those who registered on the first day:

S. M. Wilhite, city comptroller, Louisville; C. R. Hebble, board of municipal research, Cincinnati; F. R. Leach, chief inspector of the board of efficiency, Cincinnati; M. M. Foute, general accountant department of finance, Chicago; M. L. Hanscrome, city auditor, Berkeley, Cal.; E. S. Osborn, city auditor, Kalamazoo; H. W. Taylor, city auditor, Pawtucket, R. I.; J. M. Taylor, comptroller, Newport, R. I.; J. E. Milleman, comptroller, New Rochelle, N. Y.; R. F. X. Dooley, comptroller clerk, New Rochelle, N. Y.; B. B. Bodeau, deputy treasurer, New Rochelle, N. Y.; E. H. Fenton, accountant bureau of statistics of Massachusetts; James G. McIntyre, accountant, Yonkers, N. Y.; Dan Witzell, city clerk, Oshkosh; Lyle Andrews, Nashville; Thomas F. Boyle, city and county auditor, San Francisco; George E. Grass, city auditor and assessor, Oakland, Cal.; J. M. Payne, city treasurer, Chattanooga; I. B. A. Taylor, city clerk and treasurer, Middletown, N. Y.; Timothy M. Goode, city treasurer, Cambridge, Mass.; Fred Kauffman, comptroller, Hoboken, N. Y.; Charles N. Abbott, comptroller, Birmingham; C. O. Beaver, city auditor, Chattanooga; Charles F. Gittemy, director, Massachusetts bureau of statistics, Boston; George M. Rex, municipal expert, Providence; M. L. Coen, city auditor, Knoxville; R. B. McIntyre, in charge of expert accounts, New York City; Miss B. M. Townsend, city comptroller, Atlantic City; Duncan McInnes, chief accountant, New York City; J. S. Culpepper, city comptroller, Norfolk; F. E. Gunn, associate comptroller, St. Louis; Bernard Keating, city auditor, Bridgeport, Conn.; Louis M. Kotecki, city comptroller, Milwaukee; Ralph Bowman, director of the board of municipal research, Milwaukee; W. A. Dehority, state examiner, Indianapolis; W. G. Cooper, auditor board of trustees, Jacksonville; L. G. Powers, chief statistician of census, Washington; S. W. Wood, special agent census, Washington; W. G. Justice, city comptroller, Buffalo.

American Water Works Association.

The following firms have applied for space and will exhibit at the convention, Minneapolis, June 23-27: American Asphaltum & Rubber Co., Addressograph Co., American City, Badger Meter Mfg. Co., James Boyd & Bro., Buffalo Meter Co., Builders Iron Foundry, H. W. Clark Co., Columbian Iron Works, East Jersey Pipe Co., Electro Bleaching Gas Co., Engineering News, Engineering Record, Engineering and Contracting, Fire and Water Engineering, Fairbanks Co., Ford Meter Box Co., Gamon Meter Co., Glauber Brass Mfg. Co., Grove Electric Indicator Co., Hays Manufacturing Co., Hersey Mfg.

Co., Hill Pump Valve Co., International Steam Pump Co., Lead Lined Iron Pipe Co., Leadite Co., Modern Iron Works, H. Mueller Mfg. Co., Municipal Journal and Engineer, National Meter Co., National Water Main Cleaning Co., Neptune Meter Co., New York Continental Jewell Filtration Co., Patterson Mfg. Co., Pennsylvania Salt Mfg. Co., Pitometer Co., Pittsburgh Filter Mfg. Co., Pittsburg Meter Co., Platt Iron Works Co., Rensselaer Valve Co., Rickersburg Brass Co., Ross Valve Co., S. E. T. Valve & Hydrant Co., Schaeffer & Brudenberg Mfg. Co., A. P. Smith Mfg. Co., Simplex Valve Meter Co., George H. Snell, W. W. Strickler & Bro., Thomson Meter Co., Union Water Meter Co., United Lead Co., Water Works Equipment Co., and others.

PERSONALS

Blanchard, Arthur H., Professor of Highway Engineering in Columbia University, sailed on June 12th to attend the Third International Road Congress, London. Professor Blanchard is a United States Reporter on Question 3, "Construction of Macadamized Roads Bound with Tarry, Bituminous or Asphaltic Materials," and Communication 10, "Terminology Adopted or to Be Adopted in Each Country Relating to Road Construction and Maintenance." He has been appointed a delegate to the Congress by Columbia University, the American Society of Civil Engineers, the National Highways Association and the American Road Builders' Association.

Buerger, Charles B., has joined the staff of George W. Fuller, 170 Broadway, New York City. Mr. Buerger entered the service of the Bureau of Filtration at Philadelphia in 1906 as a mechanical engineer and was engaged upon the design, construction and testing of pumping stations and equipment. Later he was on the design of the preliminary filters at Torresdale and Belmont and had charge of the design of the Queen Lane filter plant. For the past two years he was senior assistant engineer in the Filtration Division of the Department of Water Supply in New York City on the design of the Jerome Park filter plant.

Blake, W. R., Sidney, O., has sent his resignation as city engineer to Mayor Duncan.

Boone, S. Clay, Winchester, Ky., has been elected road supervisor of Clark County.

Carroll, Frank, Bayonne, N. J., has been appointed street commissioner.

Die, James P., Schenectady, N. Y., formerly draughtsman in the Engineering Bureau, has been appointed inspector at the asphalt plant. He will send samples to the laboratory of J. W. Howard, New York City, for analysis.

Eley, A. J., Los Angeles, Cal., has been appointed fire chief.

Fortune, George, Bismarck, N. D., has been appointed chief of police.

Harding, James C., consulting engineer, has opened an office at 170 Broad-

MUNICIPAL APPLIANCES

way, New York City. Mr. Harding has been engaged in the practice of hydraulic and sanitary engineering for the past 21 years and has been a member of the firm of George W. Fuller for the last two years.

Holt, Dr. Joseph, New Orleans, La., has been elected president of the Parking Board. Other members are Allison Owen and J. Creighton Matthews.

Kemman, A. F., New Hampton, Ia., has been appointed county engineer.

McAlpine, James A., Spokane, Wash., has been appointed chief of police by Commissioner D. C. Coates.

McKinney, F. W., Baltimore, Md., has been appointed chief engineer of the Annex Commission, succeeding H. K. Faust.

Paul, Robert J., Dayton, O., superintendent of streets has resigned.

Pilat, Carl F., New York City, has been elected landscape architect by the Park Board of New York City. Mr. Pilat succeeds Mr. Charles D. Lay.

Stahl, Elmer, Topeka, Kan., has been appointed superintendent of the city light plant by city commissioner S. M. Newland.

Walsh, Dave, Santa Clara, Cal., has been elected chief engineer of the fire department.

The following mayors have recently been elected:

ILLINOIS.

Pana—Mayor, A. B. Gorman.

Nashville—Mayor, Christ Keyler.

Knoxville—Mayor, H. L. Butt.

Wataga—Mayor, E. O. Isaacson.

Maquon—Mayor, Ray Simpkins.

Williamsfield—Mayor, J. M. Blair.

Altona—Mayor, Thomas Hubbell.

St. Augustine—Mayor, George Davis.

Henderson—Mayor, George Hooper.

East Galesburg—Mayor, Steve Lufkin.

Yates City—Mayor, W. T. Corbin.

Olney—Mayor, Joseph Berry.

DELAWARE.

Wilmington—Mayor, Harrison W. Howell (re-elected).

MICHIGAN.

Battle Creek—Mayor, John Bailey.

CALIFORNIA.

Los Angeles—Mayor, H. H. Rose.

Salinas—Mayor, Feliz — (re-elected).

Grass Valley—Mayor, Thos. Ingram.

NEW JERSEY.

Millville—Mayor, H. J. Gieg.

LOUISIANA.

Mansura—Mayor, Arthur J. Escude.

OREGON.

Portland—Mayor, H. R. Albee.

TENNESSEE.

Covington—Mayor, Robert F. Graves.

Mt. Pleasant—Mayor, James A. Englis.

Westmoreland—Mayor, Jesse Freeman.

VIRGINIA.

Phoebus—Mayor, Samuel Crawford.

Big Stone Gap—Mayor, S. T. Fleenor.

Iron Gate—Mayor, S. M. Dickerson (re-elected).

Chase City—Mayor, W. H. Jeffreys.

South Boston—Mayor, A. H. Vaughan.

New Gas Engine of Large Capacity.

The Reading Iron Company, Reading, Pa., have placed on the market a new line of gas engines in sizes of 300 h. p. and upwards. It is the first American gas engine to employ the double-acting, two-stroke cycle. It is intended for driving electric generators, pumps, compressors and for other heavy duty service. In the design the number of working parts, as compared with other gas engines, has been greatly reduced. Multiplicity of vital working parts greatly increases liability of shut-down, which is the main argument against the use of gas engines, their fuel economy being admitted. The principal cylinder parts of the engine are 17 as compared with 47 in a tandem double-acting form-stroke engine, the only arrangement of that type suitable for high-power service.

In the two-stroke cycle, the power-cylinder is usually provided with exhaust-ports which the piston uncovers as it approaches the end of its expansion stroke. During the time that the exhaust-ports are open, an auxiliary pump forces into the power-cylinder, first, a stratum of scavenging-air, which is immediately followed by the explosive mixture body. After thus charging the power-cylinder, the exhaust-ports are again covered by the return of the piston, and the working charge is compressed. At the instant of maximum compression, the charge is fired by means of an electric-spark and the piston driven forward under the resulting explosive pressure until the end of the expansion stroke is reached, when the exhaust-port is reopened and the cycle repeated.

All previous applications of the double acting, two-stroke cycle have employed separate air and gas pumps. In this engine one double acting pump does the work. The valve gear also is original. It is actuated by an eccentric drive, the inlet valves being opened and closed by a double-toggle linkage. There are no springs except the small ones on the igniters.

The inlet valves are of the annular poppet type, coaxial with the cylinder, and that on the crank end surrounds the piston rod. This arrangement permits a large inlet port opening into the power cylinder and thus tends to reduce the pump work.

The following is a test of the 300 h. p. engine:

Duration of test—33½ hours.

Grade of coal—Westmoreland bituminous and 14100 B. T. U. per lb. as used.

Character of load—Water rheostat.

Average load registered on calibrated recording ammeter—774 amperes.

Average voltage corrected—253.

Average developed load—196 K. W. =284 B. H. P.

Power required for auxiliaries—11 K. W.=16 B. H. P.

Coal Burned.

Fed to hopper.....10,352 lbs.

Equivalent required for steam

jet blower 502 "

Total coal used in 33½ hrs...10,854 lbs.

Cold cleaned gas measured in holder 65.4 feet per pound total coal used.

Analysis of Gas.

CO₂2.91% by volume

O₂2

C₂H₄7

CO27.51

H₂ 6.52

CH₄ 2.24

Average B. T. U. of gas by calorimeter (35 determinations corrected for holder temperature and pressure)—144 B. T. U. per ft.—higher; 138 B. T. U. per ft.—lower.

Producer efficiency on basis of cold cleaned gas and total coal used—67% on higher B. T. U. of gas; 64% on lower B. T. U. of gas.

Thermal efficiency of engine—10,300 lower B. T. U. per B. H. P.—hour.

Coal per developed B. H. P.—hour, at switchboard, 1.14 pounds.

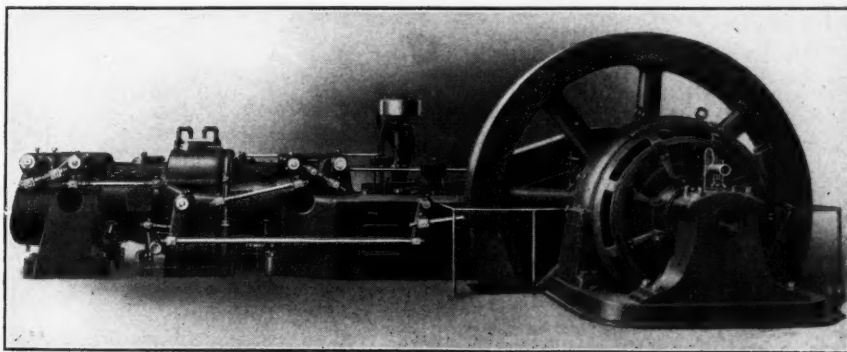
Coal per developed K. W.—hour, at switchboard, 1.65 pounds.

Coal per delivered B. H. P.—hour, available for outside purposes, 1.21 lbs.

Coal per delivered K. W.—hour, available for outside purposes, 1.75 lbs.

Buckeye Heaters.

Walter Macleod & Co., 213 East Pearl street, Cincinnati, O., manufacture a number of styles of lead melting furnaces and heaters for others purposes under the general trade name of Buckeye. In all styles the heating device consists of a pressure tank carrying kerosene and a burner. The tank of cylindrical shape is equipped with a piston air pump worked by hand. A



LARGE TWO STROKE CYCLE GAS ENGINE.



PORTABLE LEAD MELTING FURNACE.

pressure gage indicates the pressure, 20 to 30 pounds being ample. The burner simply vaporizes the oil fed to it from the tank under pressure. In order to start a burner it must be heated, a piece of cotton waste saturated with oil being generally used.

The heater shown in the illustration is one of the styles, Type S. H., made for outside contract work. The melting pot has a capacity of 450 pounds of lead. The oil tank holds 17 gallons. The net weight of the outfit is 370 pounds. It can be fitted with a powerful kerosene light without interfering in any way with its heating capacity.

One of the lightest outfits is the Type C. This will take a 12-inch melting pot of 150 pounds capacity; the net weight is 250 pounds. The kerosene tank is directly under the melting kettle.

Another type in addition to melting kettle and light has two portable burners for use in melting lead out of an old pipe joint. In one of the company's catalogues a list of over 100 water companies and departments using Buckeye heaters is given.

New Demountable Dump Wagon Bed.

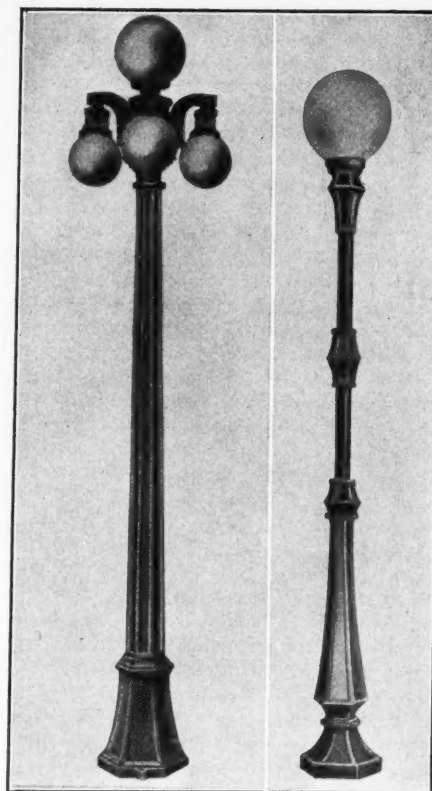
The Bull Dog Dump Wagon Company, 205 Boston Building, Kansas City, Mo., have placed on the market a demountable bottom dumping wagon bed. The feature of the wagon which catches the eye first as a novelty and is in reality the important design is the triangular center truss which forms the bottom of the wagon, giving it great strength. The illustration is a phantom view of a demountable bed of one and a half cubic yards capacity, mounted on a 44-inch wheel gear. The sides are 8 1/4 inches wide. These can be let down on a level with the hinges leaving the shoveling board four feet from the ground. When dumped, the openings each side of the center piece are 21 inches. By a simple adjustment the

wagon can be used for spreading. The bed is claimed to be absolutely sandtight and to remain so even after long use. Among the merits claimed for the Bull Dog wagon bed is the fact that it has few parts, has no ratchets, winding devices or chains; can be closed and dumped in a remarkably short time; bottom doors are unusually high above ground when load is dumped; the load is close to the team.

All lumber used in the beds is hardwood. The center piece and doors are made of 1 1/2 inch stock covered with 16 gauge steel, and the cone of the center piece is finished with 1/4 inch angle steel. The doors are strapped with 2 inch channel steel, and the hinges made of 1 3/4 x 1/4 inch steel extending 8 inches up and down on sides and doors. The hinges are hung on 1 inch steel pipe, extending the full length of the bed, through which runs a 7/8 inch steel rod with nuts and cotter pin keepers. The locks are made of 1 1/8 round steel. All steel forgings and not one ounce of castings used in the beds.

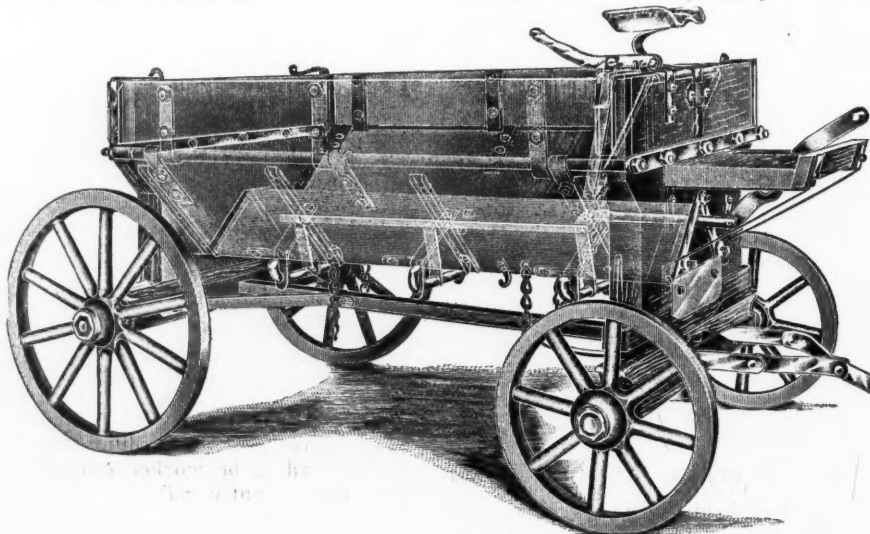
Street Lamp Posts.

The Wallace Machine & Foundry Co., Lafayette, Ind., make cast-iron lamp posts in any design submitted to them. The illustrations show two of their standard designs. The Type D four-light electric is one of their best posts. It is attractive and substantial. The hexagon shaft is particularly well adapted for the three arms. The whole post is well proportioned and gives the best lighting effect. To all appearances, it is said, it gives as much light as a five-light post, and of course costs a fifth less to maintain.

Type P. Type N.
WALLACE LAMP POSTS.

Type N is a single-light electric designed for parks and residence districts. The height is generally 10 feet to centre of globe. The design is attractive, and the post is inexpensive.

Underground Cables.—The Standard Underground Cable Company will build a new office and factory building at Sixteenth and Pike streets, Pittsburgh. It will be 50x115 ft., of steel frame, brick and concrete construction. The company will move its general offices there from the Westinghouse Building and from its works in Canada and in Perth Amboy, N. J.



BULL DOG DUMP WAGON.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago. On some sizes prices are slightly firmer. Quotations: 4-inch, \$28.50; 6 to 12-inch, \$26.50; 16-inch and up, \$25.50. Birmingham. Shipments are slow, also orders. Quotations: 4-inch, \$22; 6-inch and up, \$20. New York. Business with private buyers is good. Quotations: 6-inch, car loads, \$20 to \$24.

Lead.—Market is dull. In London prices are rising. Quotations: New York, 4.35c.; St. Louis, 4.20c.

Sewer Cleaning.—The Turbine Sewer Machine Renovating Company, 197 Eleventh street, Milwaukee, Wis., have been giving a demonstration of sewer cleaning at Marion, S. C. City Engineer J. M. Johnson was much pleased with the results. The cost of cleaning was \$0.118 per linear foot of sewer. Formerly as much as 18 cents was spent for the same kind of work.

MUNICIPAL INDEX.

(Continued from page 871.)

Engineering and Inspection, Cost of. ¼ p., Municipal Journal, May 8. 10 cts.
Cost of Designing and Inspection. ¾ p., Municipal Journal, May 15. 10 cts.
Civic Fields for the Service of Men Trained as Engineers. By O. V. D. Stout. 1½ pp., Engineering & Contracting, May 7. 10 cts.

An English View of Registration of Engineers. 1 p., Engineering Record, June 7. 10 cts.

Opportunity and a Purpose for a Local Organization of a National Engineering Society. By C. B. Wing. ¾ p., Engineering News, May 8. 15 cts.

Contracting, Some Mistakes Made in. By D. J. Hauer. 2 pp., Contractor, May 15. 20 cts.

Legal Hints for General Contractors. By T. H. Ray. 3 pp., Bulletin, General Contractors' Association, May. 10 cts.

Bidding on Contracts, Some Methods of. By D. J. Hauer. 2 pp., Contractor, June 1. 20 cts.

Unbalanced Bidding. Communications from J. P. Snow and Albert J. Himes. 1 p., Engineering News, May 15. 15 cts.

Labor, Efficiency of. Difficult Problem for the Contractor. ½ p., Engineering Record, May 10. 10 cts.

Recent Eight-Hour Legislation. By G. A. King. 2 pp., Engineering Record, May 10. 10 cts.

Washington Workmen's Compensation Act and the Results of Its First Year of Administration. By L. R. W. Allison. 2½ pp., Engineering News, May 15. 15 cts.

Exhibit, Jersey City Municipal. Illustrated, ½ p., Municipal Journal, May 15. 10 cts.

New York Municipal Parade. Illustrated. 1½ pp., Fireman's Herald, May 24. 5 cts.

Survey, City Topographic. Communications from R. A. MacGregor and Hugh C. Mitchell. ¾ p., Engineering News, May 15. 15 cts.

City Surveyor's Records. Communication from N. H. Smith. ¼ p., Municipal Journal, May 8. 10 cts.

Municipal Work in Newcastle-Upon-Tyne. Paper before Institution of Municipal and County Engineers. By W. J. Steele. 3 pp., Surveyor, May 9. 40 cts.

Municipal Enterprises in Manchester. ¼ p., Municipal Journal, May 22. 10 cts.

Public Works in the Philippines. Illustrated, 6 pp., Far Eastern Review, March. 40 cts.

Training Boys for Citizenship, Winston-Salem Plan of. By LeRoy Hodges. Illustrated, 2 pp., American City, June. 25 cts.

Satellite Cities. Efficiency and community life. By G. R. Taylor. Illustrated, 14 pp., Survey, June 7. 25 cts.

Chain of Truck Service Stations.

A chain of truck service stations has recently been established by The Goodyear Tire & Rubber Company of Akron, Ohio. Truck garages and wheel shops have been established in all of the larger cities of the country, and many more are to be added from time to time. "This action tends to overcome the only objection to the use of motor equipment for haulage," says C. W. Martin, manager Motor Truck Tire Department, The Goodyear Tire & Rubber Company. "The fact that tire change-overs often tie up trucks for a considerable length of time, has up to this time been a serious objection to the use of the motor truck. Some business men in adopting the commercial vehicle for their merchandising, have complained that they do not make the saving over horse haulage that they counted upon."

"When traffic experts have analyzed these cases they have found in many instances, either that the truck was too large for the work that was provided for it, or that the business man had not shifted his trucking system from the horse basis when he put on a truck, and was losing full value of his motor equipment by reason of allowing it to stand idle a considerable part of the time."

"In order to overcome this last objection, it is necessary to reorganize the system of maintenance, so that the truck will not be laid up for repairs. This difficulty, in the inauguration of motor trucks, was recognized by The Goodyear Tire & Rubber Company, and for that reason its chain of service stations has been established, so that hereafter truck owners will be enabled to keep their trucks busy all the time. Day and night, the new Goodyear truck garages and wheel shops will be open, to render truck owners this service. A force of expert wheelwrights and mechanics, large enough to take care of any kind of work that may come in, will be on hand. The opening of these service stations marks a wonderful stride in the advancement of motor truck industry, and is bound to stimulate the use of motor trucks. Heretofore, when it was necessary to change over a wheel from old Standard to S. A. E. Standard, it was necessary to send the wheel to a wheelwright, resulting in delays, during which the truck was laid up. Frequently the work when turned out, was found to have been done inaccurately, giving a promise of future trouble, both to the truck owner and tire man. Truck wheel change-overs were out of the usual line of the wheelwright's work, and as each wheel was an entirely different problem, it had to be worked out as such, and consequently valuable time was wasted by the tire company's representative having to personally direct practically every move the mechanic

made. To offset this condition and to allow truck owners to keep their trucks moving all the time, The Goodyear Tire & Rubber Company, with its spirit of progressiveness, determined to install these wheel shops in the larger cities where this work could be handled by men who were experts, with a consequent minimum of delay and confusion. These garages will have a place for storage, and no matter how difficult the change-over a man can put his truck in the garage at night, and the work will be finished and the truck ready for business in the morning. In connection with the garages will be a wheel shop and stock room. In the stock room will be stored everything necessary for repairing a truck, such as wheels, rim bands, bolts, fastenings, for every type of truck, and in fact everything that goes to make up the equipment of a perfect truck wheel plant."

Incinerator.—The National Incinerator Company, 303 Fifth avenue, New York City, have taken over the incinerator business of Lewis & Kitchen, Chicago and Kansas City. Samuel R. Lewis has been appointed consulting engineer of the National Incinerator Company. Lewis & Kitchen, who retain their heating and ventilating business, will be distributors of "Incinerite" devices in the territory served by their Chicago and Kansas City offices.

The National Incinerator Company succeeded the Incinerator Company of America at the death of Paul Morton, former Secretary of the Navy, who, in conjunction with M. O. Shannon organized that company to build small-sized gas-burning destructors. The business has grown remarkably, as the National Incinerator Company and the taking over of this large device business completes the "Incinerite" line.

"We were moved to take over the incinerator business of Lewis & Kitchen for many reasons," said F. E. Dayton, general manager of the National Incinerator Company. "In this new industry patents are destined to play a large part. Believing that a reasonable interpretation of patent law demanded the sharing of protection offered by basic patents with others having claims as pioneers, and desiring to avail ourselves of the patents granted to Lewis & Kitchen and applications made, covering important features of their large devices, with a desire too to complete our line, we negotiated the purchase."

Concrete Bridges.—The Concrete Steel Engineering Company, Park Row Building, New York City, have been retained by the city of Amsterdam, N. Y., to design their new concrete bridge over the Mohawk river, which will replace the steel bridge recently destroyed by the floods. The same company has been retained as consulting engineers to design a concrete bridge over the Hudson river at Glens Falls, N. Y., where a former steel bridge went out in the freshets.

WEEKLY CONTRACT NEWS

ADVANCED INFORMATION

BIDS ASKED FOR

CONTRACTS AWARDED

ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
N. Y.	Olean	6.30 p.m., June 21	Vit. brick	Comrs.
Wis.	Wauwatosa	4 p.m., June 21	Improving several streets	C. T. Chandler, Ch.
Ala.	Centerville	1 PM, June 21	Improving roads; cost, \$4,000	W. S. Kellar, State Hy. Eng.
O.	Ashland	June 21	Brick paving, 11,000 sq. yds.	F. Edwards, Dir.
Ala.	Montgomery	June 23	Gravel roads, 10 miles	T. H. Edwards, Co. Engr.
Minn.	Duluth	10 a.m., June 23	Imp. streets	R. Marchison, Comr.
Mich.	Crystal Falls	8 p.m., June 23	Grading road	W. J. Gribble, C. Clk.
Ind.	Bloomfield	7 p.m., June 23	Brick, 14,240 sq. yds.	C. C. Parker, City Engr.
Pa.	Ashley	noon, June 23	Vitrified brick	E. W. Wallace, Secy.
N. Y.	Solvay	5 p.m., June 23	Paving Newton Avenue	E. M. Hall, Clerk.
O.	Lockland	June 23	Vitrified brick	F. Reed, Vil. Clk.
Wash.	Seattle	2 p.m., June 24	Imp. roads	Co. Comm.
Ala.	Linden	June 24	Surfacing road, 4 miles	Co. Comrs.
Ill.	Ottawa	4 p.m., June 24	Vitrified brick, 61,000 yds.; curb and gutter, 41,000 ft.	G. L. Farnsworth, Sec. B. L. I.
O.	Mansfield	noon, June 24	Imp. streets	E. A. Murkel, C. Clk.
O.	Gallion	noon, June 24	Paving, 18,000 yds.	E. C. Yochem, C. Clk.
Mo.	Kansas City	June 24	Macadam, 4 miles	R. T. Proctor, Eng.
Pa.	Marcus Hook	8 p.m., June 24	Pavement with concrete base, 14,000 sq. yds.	C. H. Casey, Ch. Comm.
Ala.	Linden	June 24	Imp. 4 miles roads, cost \$7,000	Co. Comrs.
N. J.	Atlantic City	June 24	Boulevard at Mays Landing	Freeholders.
Va.	Wise Court House	June 24	Macadam 44 miles, grading 16 miles	Supervisors.
Ill.	East St. Louis	June 24	Boulevard; cost, \$100,000	Park Bd.
N. Y.	Newburgh	5 p.m., June 24	Asphalt block, bitulithic, etc.	Street Comm.
N. Y.	Binghamton	4 p.m., June 25	Concrete on Center St.	F. M. Hopkins, Clk.
Ga.	Savannah	June 25	Sheet or block asphalt or creosoted wood, 17,000 yds.	E. R. Conant, Chf. Eng.
Ala.	Greenville	June 25	Sand-Clay road; cost, \$10,000	Co. Comrs.
Md.	Baltimore	11 a.m., June 25	Sheet asphalt, 20,120 sq. yds.; vit. block, 6,800 sq. yds.	R. K. Compton, Bd. Awards.
N. Y.	Brooklyn	11 a.m., June 25	Sheet asphalt, several streets	A. E. Steers, Boro. Pres.
Okl.	Tulsa	June 25	Sheet asphalt and brick, 15,000 yds.	E. C. Hughes, City Recorder.
Ind.	Evansville	10 a.m., June 26	Highway	C. P. Beard, Co. Aud.
Ind.	New Albany	10 a.m., June 26	Improving road	J. T. Miller, Co. Aud.
Va.	Roanoke	noon, June 26	Granolithic sidewalk	F. L. Giboney, C. Eng.
Ind.	Indianapolis	10 a.m., June 26	Crushed stone and screenings, county highways	W. T. Patten, Co. Aud.
Md.	Pocomoke	8 p.m., June 26	Sheet asphalt, brick, etc., 30,000 yds.	E. J. Tull, Ch. Comm.
Ind.	Richmond	11 a.m., June 26	Improving highway	H. F. Wood, Co. Aud.
Ind.	Winchester	June 26	Macadam, 6,625 lin. ft.	H. F. Wood, Co. Aud.
Cal.	Oakland	11 a.m., June 26	Asphalt, macadam and drainage	F. M. Smith, C. Clk.
Wash.	Seattle	10 a.m., June 27	Imp. streets	C. B. Bagley, Secy.
O.	Columbus	2 p.m., June 27	Brick, 1.14 miles in Falls	J. R. Marker, State Hy. Com.
la.	St. Martinville	June 27	Cement sidewalks	A. B. Bienvenu, Mayor.
Ala.	Birmingham	June 27	Macadam road	Bd. of Revenue.
O.	Columbus	2 p.m., June 27	Waterbound macadam, 1.38 miles in Harrison	
			Concrete, .41 mile in Sugar Creek	
			Waterbound macadam, 1 mile in Salem	
			Concrete, 2.6 miles in Townsend	
			Concrete, 1.9 miles in Sandusky	
			Waterbound macadam, 3.3 miles in Liberty	
			Waterbound slag, 2.34 miles in Pittsfield	
			Bituminous macadam, 1.39 miles in Berlin	
			Brick, 1.07 miles in Chippewa	
			Brick, 1 mile in Chester	
O.	Cincinnati	June 27	Concrete culvert	S. R. Marker, St. Hwy. Comr.
Minn.	Minneapolis	noon, June 28	Concrete walks, gutters, etc.	A. Reinhardt, Co. Clk.
Ill.	Jamaica	June 28	Rock road, 12 miles	J. A. Ridgeway, Sec. Pk.
Ala.	Anniston	June 28	Macadam, 1½ miles	Fred Gaines, Town Clk.
Cal.	Bakersfield	June 28	Asphaltic concrete	Co. Comrs.
Mo.	Popular Bluffs	7.30 p.m., June 30	Vit. brick, 36,000 yds.; cost, \$88,000	H. F. Murdock, C. Clk.
O.	Clyde	June 30	Vit. brick, cost \$10,000	E. C. Thomas, City Eng.
O.	Euclid	June 30	Vit. brick	F. Shaw, City Clerk.
Wash.	Everett	2 p.m., June 30	Roads	F. H. Shoaff, Vil. Clerk.
Utah	Ogden	10 a.m., June 30	Sidewalks	Co. Aud.
la.	Eagle Grove	7.30 p.m., June 30	Pavement, 30,000 yds.	H. J. Craven, C. Eng.
Mich.	Sturgis	June 30	Vit. brick, 5,000 sq. yds.	Sam Middleton, C. Clk.
O.	Elyria	June 30	Macadam, 3,970 ft., cost \$5,850	C. W. Coy, C. Clk.
Okl.	Okmulgee	7.30 p.m., June 30	Bit. concrete, 39,000 sq. yds.	T. L. Gibson, Co. Surveyor.
Mo.	Kansas City	June 30	Macadam roads, 10 miles, 3 jobs	J. C. Lyons, Comr. Pub. Wks.
Pa.	Crafton	5 p.m., July 1	Paving McMunn ave.	L. M. Gilday, Clk.
Cal.	Sacramento	2 p.m., July 1	State highways, 29 miles	J. S. Haring, Boro. Engr.
Wis.	Burlington	July 1	Paving Geneva st.	W. R. Ellis, Sec. Comm.
N. J.	Elizabeth	8.30 p.m., July 1	Vit. brick, 18,000 yds.	City Clerk.
Ind.	Fort Wayne	10 a.m., July 1	Highway, 3 miles	W. P. Neafsey, Comr.
Ala.	Anniston	July 1	Macadam, 1½ miles; cost, \$4,000	C. H. Brown, Co. Aud.
Wis.	Racine	10 a.m., July 5	Paving, 1,076 yds.	W. S. Kellar, State Hwy. Engr.
Ind.	Vevay	1 p.m., July 7	Highway, 7 miles	P. H. Connolly, Ch. E. P. W.
N. C.	Chapel Hill	July 7	Imp. 10 miles highway	G. W. Smith, Co. Aud.
N. J.	Bloomfield	July 7	Bitulithic, 2,750 sq. yds.	Good Roads Comm.
N. C.	New Bern	noon, July 7	Road ditches, several miles	R. F. Davis, Town Clk.
Ind.	Jeffersonville	10 a.m., July 7	Paving two roads	R. E. Snowden, Hwy. Engr.
N. J.	Westfield	July 7	Improving East Broad St.	G. W. Stoner, Co. Aud.
Ind.	Wabash	1.30 p.m., July 8	Gravel road, Chester Township	C. Clk.
Ind.	Monticello	10 a.m., July 8	Highways	D. Showalter, Co. Aud.
Ind.	Marion	July 8	Stone and gravel roads	A. G. Fisher, Co. Aud.
				E. H. Kimball, Co. Aud.

BIDS ASKED FOR

STATE	CITY.	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Miss., Grenada	July	8..Vit. brick, wood, &c., 14,000 yds.	L. B. James, C. Recorder.	
N. D., Bismarck	July	8..Improving roads	Co. Comrs.	
Ind., Vincennes	2 p.m., July	8..Gravel roads	J. T. Scott, Co. Aud.	
O., Cincinnati	noon, July	11..Repairing roads, culverts	S. Struble, Pres.	
Ind., South Bend	11 a.m., July	14..Imp. highway	C. Sedgwick, Co. Aud.	
SEWERAGE				
Kan., Kinsley	June	23..Sewer system	M. A. Wilson, C. Clk.	
N. Y., Gates	2 p.m., June	23..Vit. pipe, 1,050 ft.	M. J. Magin, Clk.	
N. Y., Ogdensburg	7.30 p.m., June	23..Sewers, 6,660 ft.	D. G. Crichton, C. Clk.	
N. Y., Rochester	2 p.m., June	23..Vit. pipe, 1,050 ft.	M. J. Magin, Clk.	
la., Waterloo	7.30 p.m., June	23..Vit. pipe, 6,000 ft. 10 to 15-in.	R. L. Degon, C. Clk.	
Pa., Etna	5 p.m., June	23..Sanitary sewer	J. C. Armstrong, Boro Clk.	
Minn., Duluth	10 a.m., June	23..Sanitary sewers	C. S. Palmer, Clk.	
O., Mansfield	noon, June	24..Storm sewers	E. A. Blecker, Dir. Serv.	
Pa., Blairsville	8 p.m., June	24..Sanitary sewers, 22,000 ft. 6 and 8-in. water-proof joints and 50,000 sq. yds. brick or other pavement, 47,000 lin. ft. curbing	H. R. Myley, Secy.	
Mo., St. Louis	Noon, June	24..Joint Dist. sewer	Comrs.	
Del., Newark	June	25..Sewerage system and disposal plant	T. C. Hatton, Engr.	
Okla., Henrietta	8 p.m., June	25..Sanitary sewers	Benham Engr. Co., Okla. City.	
Minn., Duluth	10 a.m., June	26..Sanitary sewers	C. S. Palmer, Clk.	
Minn., Thief Riv. Falls	8 a.m., June	27..Sewers	W. H. Quist, City Clk.	
Ind., Marion	9.30 a.m., June	27..Combined sewers cost, \$32,000	F. R. Heck, Clk.	
Ind., Rockport	June	27..Sewers, 8 to 24-in.	J. G. Rimstidt, Ch. Comm.	
S. D., Howard	June	30..Sewerage system and disposal plant	G. F. Jehn, C. Aud.	
Pa., Hammononton	June	30..Sewers and disposal plant	Bd. Sewerage.	
O., Port Clinton	Noon, June	30..Sewer several streets	J. A. Singler, Clk.	
S. C., Walterboro	July	1..Pipe sewers, 4 miles, 8 to 12-in.	S. N. Johnston, Eng.	
N. J., Newark	July	1..Three centrifugal pumping engines	J. S. Gibson, Clk. Comrs.	
Canada, The Pas	6 p.m., July	1..Vit pipe, 13,000 ft. also steel pipe, power house, pole line	H. H. Elliott, Secy.	
la., Eagle Grove	7.30 p.m., July	1..Tile sewer, 1,100 ft. 8 and 10 in.	S. Middleton, Clk.	
N. Y., Schenectady	July	2..Sewage pumping station, machinery and force main	Bd. of Contract.	
N. Y., Schenectady	2.30 p.m., July	2..Pumping station and machinery	F. E. Johnson, Secy.	
S. D., Mitchell	8 p.m., July	7..Sewers, 1,331 ft. 8-in.	N. H. Jensen, C. Aud.	
Minn., Winona	July	7..Vit. pipe, 1,100 ft. 8-in.	H. B. Walling, C. Eng.	
O., Shelby	noon, July	9..Sewage treatment plant	B. Fix, Vil. Clk.	
N. J., Newark	2 p.m., July	15..Sewerage concrete pipe, 4,500 ft., etc.	Passaic Valley Sewage Co.	
La., New Orleans	July	15..Extension to pumping station	F. S. Shields.	
Mo., Webster Groves	July	21..Vitrified pipe and disposal plant; cost, \$20,000	W. A. Fuller, C. Eng.	
La., New Orleans	July	28..Extending drainage pumping station	F. S. Shields, Secy.	
La., New Orleans	July	28..Underground conduit, gates, etc.	F. S. Shields, Secy.	
WATER SUPPLY				
O., Painesville	noon, June	21..Intake and crib	S. A. Haskell, Dir. P. S.	
Va., Front Royal	2 p.m., June	21..Mechanical filtration plant, 1,000,000 gals.	W. W. Pettitt, Ch. Comm.	
O., West Park	June	21..Cast-iron pipe	F. Feuchter, Clk.	
N. Y., New York	2 p.m., June	23..Water mains, hydrants, valves, &c.	J. W. F. Bennett, Act. Comr.	
O., Springfield	noon, June	23..Cast-iron pipe, 50,000 ft. 10 and 12-in.; lead, jute, etc.	E. D. Seggerson, Clk.	
O., Akron	Noon, June	24..C-I. pipe, 4, 6, 10, 12, 16-inch, etc.	R. M. Pillmore, Dir. Pub. Ser.	
Mass., Agawam	2 p.m., June	24..Furn. 100 hydrants; pig lead, 18 tons.	E. A. Kellogg, Ch. Comrs.	
Mass., Boston	noon, June	24..Hydrants for high pressure, 410.	C. H. Slattery, Supt. Supplies.	
Me., Belfast	June	26..Dam and purification plant, cost \$20,000	Belfast Water Co.	
Mass., Chester	2 p.m., June	27..C-I. pipe, 15,000 ft. 4 and 6-in.	Comrs.	
O., Euclid	June	30..C-I. pipe	F. H. Shoaff, Vil. Clerk.	
Cal., Burlingame	June	30..Distribution system	Bd. of Trustees.	
N. C., Goldsboro	July	1..Pumping station, filter plant	Mayor.	
N. C., Cherryville	July	1..Pumping station, electric pumps, reservoir, steel tanks, cast-iron pipe, 5 miles, etc.	J. B. Houser, Mayor.	
Ga., Royston	July	1..Water works and sewers	C. B. Wellborn, Mayor.	
Egypt, Cairo	July	1..Furn. equipmt for pump'g station, 7,000,000 meters.	Pub. Works Ministry.	
S. C., Waterboro	July	1..Reservoir, tank, cast-iron pipe, etc.	Mayor.	
Ind., Decatur	July	1..Concrete reservoir	H. M. Devoss, C. Clk.	
la., Decorah	July	2..Cast-iron pipe, 1,000 ft. 4-in., etc.	C. Clk.	
S. D., Mitchell	8 p.m., July	7..Cast-iron pipe, 950 ft.	H. N. Jensen, City Aud.	
O., Painesville	Noon, July	8..Water purification works, 3,000,000 gal. capacity	S. A. Haskell, Dir. Pub. Ser.	
LIGHTING AND POWER				
Ill., Chicago	11 a.m., June	21..Lighting fixtures for bridge	L. E. McGann, Comr.	
O., Cincinnati	June	23..Lighting system in schools	C. W. Handman, Mgr.	
Canada, Winnipeg	11 a.m., June	26..Arc-lamp carbons and glass ware	Bd. of Control.	
O., Plymouth	June	26..Generators and switchboard	J. S. Smith, Clk.	
Wash., Seattle	10 a.m., June	27..Switchboards	C. B. Bagley, Secy.	
N. J., Lyons Farms	8 p.m., June	30..Incandescent lamps, 78, for Hillside Twshp.	G. Compton, Clk.	
N. J., Newark	4 p.m., June	30..Street lights, 219 32-CP, in Union Twshp.	G. Compton, Twnshp. Clk.	
Pa., West View	July	1..Lighting borough	W. H. Skiles, Pres.	
Ga., La Grange	5 p.m., July	8..Municipal water gas plant	J. D. Edmundson, Mayor.	
FIRE EQUIPMENT				
O., Marion	June	21..Fire station	M. A. Mickley, Dir.	
N. Y., New York	11.30 a.m., June	23..Motor-driven hose wagons (10). Constrn. at Central fire-alarm station	Jos. Johnson, Fire Comr.	
O., Greenville	Noon, June	26..Fire apparatus; cost, \$10,000	H. B. Hole, Clk.	
D. C., Washington	2 p.m., June	27..Fire hose, 15,000 ft. 2 1/2-in.	Dist Comrs.	
N. Y., Ilion	2 p.m., June	28..Auto comb. chem. and hose	A. E. Dengler, Pres. Village.	
Ky., Maysville	June	30..Fire hose, 1,000 ft.	City Clk.	
Mass., Holyoke	July	1..Two motor comb. chemical and hose wagons	J. Hildreth, Sec. Comr.	
O., Cleveland Heights	July	8..Motor comb. hose and ladder truck	H. H. Canfield, Vil. Clk.	
BRIDGES				
Ind., Richmond	11 a.m., June	21..Bridges	L. S. Bowman, Co. Aud.	
Pa., Clearfield	June	21..Concrete bridge, 7,500 cu. yds.	E. W. Hess, Eng.	
Ohio, Ashtabula	1 p.m., June	23..Superstructure	A. V. Hillyer, Clk.	
Va., King William	noon, June	23..Concrete bridge	Co. Supervisors.	
O., Toledo	10 a.m., June	24..Concrete abutments and culverts	C. J. Sanzenbacher, Co. Aud.	
D. C., Washington	2 p.m., June	24..Seven-span concrete bridge	District Comrs.	
Pa., Williamsport	Noon, June	24..Eight steel bridges, 3 stone arch bridges	A. P. Zuber, Co. Clk.	
O., Youngstown	11 a.m., June	25..Concrete bridges	I. M. Hogg, Co. Aud.	
Ohio, Akron	noon, June	27..Number of bridges	C. L. Bower, Clk. Comr.	
O., Cincinnati	noon, June	27..Bridges	A. Reinhardt, Co. Clk.	
O., Cleveland	11 a.m., June	28..Bridge work	J. F. Goldenbogen, Co. Clk.	
Va., Tazewell	noon, June	30..Concrete bridge	Co. Supervisors.	
Ark., Newport	2 p.m., June	30..Reinforced concrete bridge	W. D. McLain, Ch. Bd. Imps.	
Va., Portsmouth	noon, July	1..Number of bridges	E. B. Hawks, Chmn. Comm.	
O., Cleveland	11 a.m., July	2..Concrete bridge	G. F. Goldenbogen, C. Clk.	
O., Carthage	Noon, July	3..Repairing abutment and span concrete bridge	A. Reinhardt, Clk.	

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Fenn.	Lebanon	July 7	Concrete bridge	City Eng.
Cal.	Los Altos	July 7	Concrete bridge	J. G. McMillan, Co. Surv.
O.	Cleveland	11 a.m., July 9	Concrete arch bridge	J. F. Goldenbogen, Clk.
Del.	Wilmington	Noon, July 15	Concrete bridge, 2,500 cu. yds	B. F. Groves, Pres. Court.
Ga.	Macon	9 a.m. July 15	Four concrete bridges, 100 ft. long	J. R. Bowdre, Co. Clk.
MISCELLANEOUS				
O.	Dayton	noon, June 23	Wire fencing	L. E. Orendorf, Secy.
N. Y.	New York	12.15 p.m., June 24	Section 4 of subway	Pub. Serv. Commission.
Ill.	Chicago	noon, June 25	Garbage reduction plant	S. E. McGann, Comr.
N. Y.	Schenectady	2.30 p.m., June 25	Concrete curbs and posts	Bd. of Contract & Supply.
Wash.	Seattle	10 a.m., June 27	Retaining walls	C. B. Bagley, Sec.
N. J.	New Brunswick			
Pa.	Harrisburg	2.30 p.m., June 27	Retaining wall, 12,000 cu. yds. concrete	E. C. Thompson, Sec. Bd.
Wash.	Everett	2 p.m., June 30	Five passenger automobile	Co. Comrs.
Ind.	Fort Wayne	3 p.m., June 30	Dredge for hoisting road material	H. E. Branning, Twnshp Trs.
Pa.	Harrisburg	2.30 p.m., June 30	Retaining wall	P. H. S. Hendricks, Dir.
La.	Oberlin	1 p.m., July 1	Concrete dam, 1,150 cu. yds.	E. C. Thompson, Sec. Bd.
N. Mex.	Albuquerque	July 7	Jail	R. C. Bond, Pres. Jury.
N. Y.	New York	10 a.m., July 7	City Hall	City Engr.
Del.	Wilmington	Noon, July 8	Motor trucks, one to ten	M. G. Zalinski, Q. M.
N. J.	Trenton	July 8	Two ten-ton rollers, steam or gasoline	B. A. Groves, Pres. Levy Ct.
La.	New Orleans	noon, July 28	Imp. hospital	City Clerk.
			Traveling crane	F. S. Shields, Secy.

STREETS AND ROADS

Tuscaloosa, Ala.—Decision has been made to build four more miles of good road, thus making 18 miles between two cities of Moundville and Tuscaloosa, a continuous first class highway.

Mesa, Ariz.—Resolution has been passed to do needed grading and sidewalk improvements on S. Robinson st., also to put in sidewalks on S. MacDonald st., S. First ave. and full sidewalks on Main st.

Colusa, Cal.—Cost of improvements to roads, culverts and bridges in county is estimated at \$411,183.75.

Etna, Cal.—Supervisors have been petitioned to ask Highway Commission to look into possibilities of running State Highway through Western Siskiyou.

Marysville, Cal.—Board of Supervisors has petitioned State Engineering Department to widen grade of State highway in two places in stretch being built between Wheatland and Marysville.

Richmond, Cal.—Ordinance has been passed by City Council authorizing paving of 11 miles of streets, making 19 miles to be improved during summer.

Sacramento, Cal.—1,200 4 per cent. highway bonds will be offered for sale at par by State Treasurer Roberts on June 16.

San Francisco, Cal.—Definite programme for road improvement down peninsula has been arranged.

San Jose, Cal.—Resolutions of intention to pave Market st. from San Carlos to the First-street junction. St. John from Sixth to Seventh and uncompleted portions of Julian between Terraine and Santa Teresa have been given first reading.

Pueblo, Col.—Paving of streets from 10th to 24th will be petitioned for.

Windsor, Conn.—Contract for rebuilding section of highway on Palisado ave., which was turned over to State Highway Commission by vote of town on April 2, has recently been let to Amosite Co.

Laurel, Del.—Taxpayers will vote on bond issue of \$30,000 for street improvements. If vote is favorable, bids will be asked at once for street work, estimated to cost \$60,000. Herbert W. Hatton, 506 Equitable Bldg., Wilmington, Del., is Engr.

Wilmington, Del.—Bonds in sum of \$100,000 for highway improvement will be sold until 12 noon June 27. E. B. Hollingsworth, Chr. of Finance Committee.

De Land, Fla.—It has been unanimously voted to appropriate sum of \$1,200 toward building of road to Shiloh.

East St. Louis, Ill.—The East St. Louis Park Board will probably advertise for bids for the construction of the big park boulevard.

Edwardsville, Ill.—Edwardsville Township will construct about twenty-five miles of roads in next five years at cost of \$200,000. Three miles will cost approximately \$35,000, and with the passage of the bill the township will save about \$10,000.

Quincy, Ill.—A new driveway entering Riverview Park is being planned.

Fort Wayne, Ind.—Board of Public Work has adopted resolutions for paving 18 streets. Bids will be asked for shortly. Frank M. Randall is City Engr.

Des Moines, Ia.—Polk county's road system is being sectionized and as soon as this is done, contracts will be let by Board of Supervisors for their dragging throughout the summer. Every one of the 175 miles of road in county that is in the system will be dragged at county expense after every rain.

Keokuk, Ia.—City Council has approved resolution for paving of Fifth St., from Blondeau to Orleans St. with concrete. J. F. Winters is City Engr.

Oskaloosa, Ia.—Bids will be asked for about a mile of brick paving.

Waterloo, Ia.—Concrete pavement has been ordered placed on portions of Commercial, Miles and McKinley sts.

Fort Scott, Kan.—Bourbon County is placing addition of eight miles of good roads from west end of Humboldt rd. to Redfield.

Fort Scott, Kan.—Resolution providing for extension of Seventh District sewer, southward, to include Twelfth, has been adopted.

Lexington, Ky.—Mayor Cassidy and Commissioner George Land have visited East Seventh st. to view that street with idea of recommending its reconstruction with macadam from Shropshire ave., or where street railway turns in Loudon subdivision, to city limits.

Mt. Sterling, Ky.—At special meeting of City Council at request of large number of residents residing on Maysville st., Council has ordered streets improved by reconstructing them with asphalt.

Boston, Mass.—Mayor has sent to Council for its acceptance legislative act authorizing widening and extension of Avery st. at cost of \$1,500,000, and matter has been referred to committee on finance.

Charlotte, Mich.—Eaton County Road Commissioners will construct nearly 10 miles of state reward road, which has been officially adopted as trunk line through Eaton county. Latter stretches must be 24 ft. wide with 16-ft. track, and state reward is \$1,700 a mile, with Eaton county entitled to build 48 miles, each county being entitled to build three times as many miles as there are townships.

Grand Rapids, Mich.—Improvement of Lexington ave. is being urged.

Duluth, Minn.—West Duluth is practically assured of highway connecting Proctor with suburb this year.

St. Paul, Minn.—County is advertising for bids for improvement of Arcade st., from White Bear and Bald Eagle road around north end of Lake Gervais. Bids are being asked for grading, clayey and graveling the extension of the St. Paul and Lake Phalen road around south shore of White Bear.

Jackson, Miss.—Bond issue of \$250,000 has been voted of which \$60,000 is for street improvements.

Chillicothe, Mo.—Paving of North Locust st., from Bryan to city limits, has been petitioned for.

Chillicothe, Mo.—Paving petitions have been presented to City Council Monday as follows: For paving of Elm st. from Calhoun st. north to Ninth st.; for paving of Ninth st. from Elm st. west to Locust; for paving of Locust st. from Bryan north to the city limits; for paving of Walnut st. between Jackson and Calhoun; for completion of paving of alley in rear of Sweetland drug store.

Petitions have been accepted and resolutions passed and ordered published.

East St. Louis, Mo.—City Engineer Harper has given Board estimate No. 7 on cost of paving Lynch ave., 26th st. and Caseyville ave., all considered as one large contract. Estimated cost was fixed by City Engineer Harper at \$16,000.

Hannibal, Mo.—Routes for county seat roads between Marion and Monroe and Shelby counties have been determined by National County Board of Road Commissioners. Route from Palmyra to Paris, Monroe county, as selected, is through new market neighborhood. Other goes from Palmyra to Shelbyville by way of Philadelphia and Heather. Funds will be raised for improvement of highways.

Poplar Bluff, Mo.—Poplar Bluff City Council has ordered Main, Pine and Vine streets in the residential section paved with vitrified brick and is advertising for bids.

St. Joseph, Mo.—Petition asking for mineral rubber asphalt on Felix st., from 28th to 32d sts., has been presented. Just half of the property on Edmond, between 24th and 25th sts., asking for grading, was represented on a petition. The board decided to start the improvement on its own motion. A minority petition asking for Hassam paving was presented by persons owning property abutting Edmond from 29th to 31st sts.

St. Joseph, Mo.—Bids for public work amounting to many thousands of dollars will be advertised by Board of Public Works. Eighteen jobs, including paving and grading of various streets, are on the list.

Billings, Mont.—Because they were believed to be excessive, all bids on culvert work for county this summer have been rejected by County Commissioners. There were four bids. The commissioners will advertise again.

Helena, Mont.—Helena plans this season to spend \$363,680 on its streets, sewers and water works system.

Las Cruces, N. M.—Dona Ana County taxpayers have voted almost unanimously for good roads bond issue of \$100,000.

Kenilworth, N. J.—Special election will be held to vote on macadamizing of following streets: Michigan ave., from the Boulevard to the Roselle Park line; the Boulevard, from 21st st. to Chestnut st.; 22nd st., from the Boulevard to Washington ave., and Washington ave., from 21st to 22nd st.

Buffalo, N. Y.—Board has authorized Secretary Kelkirk to take necessary steps to provide funds for paving of Kenilworth ave., connecting Main st. with the Niagara Falls boulevard. Board is ready to award the contract as soon as money is available. Cost of work will be about \$20,000.

Firthcliffe, N. Y.—At special election held in Cornwall proposition No. 1, which provides for appropriation of \$8,000 to build road from Canterbury bridge to State road No. 42 at Orr's Mills, was carried.

Little Falls, N. Y.—Paving of Elizabeth st., from 5th to 6th sts., is being discussed.

Newburgh, N. Y.—Improvement of highway, known as Middletown-Montgomery highway is being discussed.

Niagara Falls, N. Y.—Acting upon request of Board of Public Works Common Council has adopted resolution asking Board of Estimate and Apportionment to issue certificates of indebtedness for \$1,500 with which to make repairs to Niagara st. pavement between Second and Eighth sts.

White Plains, N. Y.—Washington ave. is to be extended from its northerly end to Chatterton ave.

Columbus, O.—Bids will be readvertised for grading and paving with concrete the Geauga Co. State Highway H, Pet. 537, Scotland Station Easterly road, Inter-County No. 15, in Chester Township. Length, 5,800 ft., or 1 1/10 miles; for grading and paving with water-bound macadam the Fairfield Co. State Highway A, Pet. 449, Lancaster-Newark road, Inter-County No. 359, in Walnut Township. Length, 22,616.5 ft., or 4.28 miles; and for grading and paving with water-bound macadam the Jefferson Co. State Highway D, Pet. 660, Sec. No. 1 Canton-Stebenville road, Inter-County No. 75, in Springfield Township. Length, 12,700 ft., or 2.40 miles. Width of paving 14 ft. James R. Marker, State Highway Comr.

Defiance, O.—State Highway Commission has appropriated \$16,200 to be used in connection with equal sum to be supplied by county, townships through which Pike passes and adjoining property holders, making total amount of \$32,400 to be used in making permanent road over portion of the Hicksville Pike. County Engineer Wisda expects soon to receive orders to make survey of road with view to its permanent improvement.

Hamilton, O.—It has been estimated that resurfacing and repair of asphalt streets would take \$27,677.50, while filling in of Lane, Owen and Long sts. and South and Central ave. would cost \$20,770.20.

Newport, O.—Commissioner of Finance William Eimer has been instructed to advertise for sale remaining \$50,000 worth of bond in street issue of 1911.

Toledo, O.—Ordinance providing for repaving Monroe st., from Summit to Erie st., has been passed by Council. Council has also passed ordinance for paving of Winthrop st., from Collingwood ave. to Scottwood ave.

Urbana, O.—County Commissioners have ordered \$20,000 worth of bonds to be sold, money to be used in repairing roads and bridges damaged by flood. Bonds will be sold June 30.

Youngstown, O.—Street improvement bonds amounting to \$50,990 have been sold.

Toledo, O.—Summit st., from Cherry to Perry st. bridge will be paved with creosoted wood block on 6-in. concrete foundation, according to contract which Service Director Cowell was authorized by Board of Control to enter into with Garrigan Bros. Co. The Garrigans were lowest bidders for wood block at \$41.-316.75, about \$1,800 lower than nearest competitor, the Russell & Jennison Co. Contract for paving of Cherry st., from Summit to Bancroft will be awarded to H. P. Streicher. Streicher bid was \$29,744.40 for asphalt pavement over the present Medina stone pavement. Albert Gryzbowski was awarded contract for paving of Central ave., from Hartman to Elm sts. His bid for a vitrified brick pavement was \$4,441.18.

Erie, Pa.—Ordinances have been passed for curbing and paving various streets.

Hanover, Pa.—Board has signed petition for construction of 3,155 ft. of good roads with state aid in York st., Hanover, and it has been sent to State Highway Department for improvements to be made.

Harrisburg, Pa.—Gov. John K. Tener has approved Buckman act for submitting to people for their approval or rejection proposed amendment to Constitution for issuing of \$50,000,000 bonds for good roads.

Meadville, Pa.—Extensive road building has been planned for Crawford County.

Steelton, Pa.—Plans are being made for paving of various streets, including Front and Second sts.

Memphis, Tenn.—Nearly half a hundred citizens of Rosemark and Millington have appeared before Shelby County Commission urging construction of public highway connecting these two towns.

Knoxville, Tenn.—Knox county road commission will instruct Edward J. Gorham, county engineer at once to make survey for construction of road leading from Rutledge pike through

property of American Zinc Company of Tennessee connecting with Jefferson county pike at Straw Plains.

Dallas, Tex.—County Commissioners' Court has ordered submission at general election of July 19 of proposition for county to issue \$80,000 of bonds for paving of Dallas-Oak Cliff viaduct. Order leaves material to be used at option of Commissioners, but creosoted wood blocks is materially generally favored.

Dallas, Tex.—County Commissioners' Court has ordered opening up and construction of about one mile of new road to connect West Dallas pike with Cement City, saving more than a half mile over distance by present road to West Dallas. New road is to begin at what is known as Fisher farm, 1 1/2 miles west of court house, on West Dallas pike, and will extend seven-eighths of mile to southern corporate limit of Cement. Then on north side of town an extension will be opened up for about 400 yards.

Dallas, Tex.—County Engineer J. F. Witt has submitted to County Commissioners' Court estimate ordered by Commissioners on cost of repaving entire viaduct with creosoted pine blocks, placing entire cost of work at about \$75,000.

Gainesville, Tex.—E. B. Blanton has been awarded the Milan county road district bonds in sum of \$150,000.

Galveston, Tex.—At regular weekly meeting of Board of City Commissioners plans were laid for extensive improvements on streets of city.

Port Arthur, Tex.—Bonds will probably be issued for paving of portion of Procter st.

Sherman, Tex.—City secretary has been instructed to advertise for bids for curbs and guttering on Center st.

Ogden, Utah.—Bids will be advertised for building of concrete sidewalks on Quincy ave., between 20th and 22nd sts., and on Grant ave., between 19th and 20th sts.

Ogden, Utah.—"Honeycomb speedway," or lower 25th st., is to be repaved.

Bristol, Va.—The Rocky Station district and Rose Hill district of Lee county will vote on June 24 on proposition to issue \$76,000 in road bonds.

Clintwood, Va.—Clintwood Magisterial District has recently voted bond issue of \$4,000 for construction of road. Grading will be done this summer.

Fredericksburg, Va.—Election in Washington district, Westmoreland county, held on question of issuing bonds for permanent improvement of public roads in that district, has been carried.

Portsmouth, Va.—Street committee of Council has been authorized to proceed with negotiations for opening of Dinwiddie st. into Fifth st., making one continuous street.

Portsmouth, Va.—It has been decided by Norfolk County Board of Supervisors to open new road 30 ft. wide and half a mile long, extending from Sewall's Point to Mason's Creek road.

Portsmouth, Va.—Bids for placing of concrete culvert through marsh and drain at end of Dinwiddie st. have been advertised for and work will shortly be started on culvert.

Richmond, Va.—Ordinance providing for opening up of R st., between 31st and 32nd sts., was referred to special subcommittee composed of Councilman Mills and Alderman Nelson for investigation and report.

Burlington, Wis.—Petitions have been received asking for various street improvements.

Depere, Wis.—City Council has ordered that 13 city blocks be paved with concrete.

Portage, Wis.—Portage Council has passed finally ordinances for paving of Caldwell ave., Mountain ave., Washington, Cambria and Gillespie and North Railroad sts.

Racine, Wis.—More than \$21,000 will be spent on highway improvements in Racine county this year. Of this largest sum will be expended in Yorkville township.

Superior, Wis.—Board of Public Works will advertise for bids for paving of alley north of Broadway, between Tower and Ogden aves., with concrete, as soon as the City Commission gives necessary authority.

Niagara Falls, Ont.—The Stamford Township Council has authorized Engineer Gardner to prepare specifications and advertise for proposals for two miles of concrete sidewalks. Bulk of new walks are to be placed at south end and rest will be laid in new streets laid out in what is known as Pease subdivision.

CONTRACTS AWARDED.

Anniston, Ala.—County Commissioners' Court has closed two additional contracts with Goodrich & Crinkley for construction of permanent roads. One contract is extension to macadam road now existing to vicinity of Alexandria. Balance of road, over steep hill this side of Alexandria is to be completed and about two miles of the Middleton road improved. Other contract is for extension of good road in Choccolocco Valley between Choccolocco and White Plains through and beyond White Plains. When these contracts are finished there will be something like 35 miles of macadam road in Calhoun county outside of municipal limits.

Red Bay, Ala.—By State Highway Engineer for 1 1/2 miles gravel road to L. W. Lawler, of Red Bay, at \$4,250.

Los Angeles, Cal.—For paving portion of Vernon ave. to Fairchild Gilmore Wilton Co., Pacific Electric Bldg., at \$12,392; and for improving Parkdale ave. to O. L. Stevens at \$9,361.

Washington, D. C.—For asphalt block pavement to Washington Asphalt Block & Tile Co., of South Capitol and R sts., at \$1.79 per sq. yd.

Burnham, Ill.—For asphalt macadam pavement on Park, Pullman and Rand avs., Center and 141st sts., to Nedy & Greenwald, of Whiting, Ind., at \$1.33 1/2 per sq. yd.; fill, 43 cts. per cu. yd.; curb, 38 cts. per lin. ft.

Christopher, Ill.—For laying 277,500 sq. ft. concrete sidewalks with vitrified clay pipe sewer and bulkhead to Keeley Bros., of East St. Louis, at \$32,746; J. A. Moorman, City Clk.

Elgin, Ill.—For paving Division st. to Western Improvement Co., at \$22,690. Other bidders: Logan & Gierz Construction Co., Elgin, \$25,075; H. G. Goeltz, Chicago, \$26,097, and McCarthy Improvement Co., Davenport, Ia., \$25,869. Morgan H. Brightman is Engr. Bd. Local Improv.

Greenville, Ill.—Contract finally has been let for three-quarters of mile of brick pavement on Beaumont ave. in this city. This is part of old national ocean-to-ocean trail. Contract was let to E. L. Curdy, of Alton, at a little more than \$15,000.

Monmouth, Ill.—By Board of Local Improvements, to M. A. Hoag, at \$5,789.68, for construction of brick pavement on concrete foundation.

Normal, Ill.—By Board of Improvements, for pavement of Fell ave. and Mason st., to R. L. Williams at \$15,585.55.

Quincy, Ill.—By Board of Local Improvements, contract for paving of Fifth st., between Hampshire and Vermont sts., with creosoted blocks, to Frank Rees. Mr. Rees submitted only bid, agreeing to do work for sum of \$3,224.85.

Richmond, Ind.—Contract for improvement to West Pearl st. has been awarded to Nolte & Thompson at \$4.97 a front ft.

Greenfield, Ia.—By city to J. S. McLaughlin & Sons, Red Oak, at following bid: 3,000 cu. yds. excavation at 35c.; 8,700 lin. ft. new cement concrete curb at 31c., and 11,300 sq. yds. plain concrete at \$1.34. Chas. P. Chase, Consulting Engr., Clinton, Ia.

Junction City, Kan.—For paving to Dalton & Sons as follows: 20,200 sq. yds. asphaltic concrete, 5-in. base, \$1.40 per sq. yd.; 12,100 lin. ft. curb and gutter, 43 cts.; 2,300 lin. ft. curb, 37 cts. W. Van Buck is City Engr.

Winchester, Ky.—By City Council contract for construction of brick streets to Milner Brothers and Co., of Louisville, at \$2.32 per sq. yd. Streets which will be bricked are: Main st., from the C. & O. tracks to the L. & E. bridge; Broadway, from Main to the L. & N. crossing; Lexington ave., from Main to Maple; Washington st., from Main to Maple; Winn ave., from Main to Pendleton.

New Orleans, La.—For paving Magazine st., through Audubon Park, with Tarvia concrete by City Council to Adams & Stewart, at \$1.48 per sq. yd.

Baltimore, Md.—Bids opened by Board of Awards for Annex Commission Contract No. 120 show Baltimore Asphalt Block & Tile Co. to be lowest bidder. This company, which recently leased the plant of the F. E. Schneider Paving Co., bid \$1.49 per sq. yd. for the contract, which calls for bituminous concrete. P. Flanigan & Sons was next lowest bidder at \$1.55 per sq. yd. The streets embraced in this contract are Cedar, Carwell and Dulin aves. and Twenty-fourth and Twenty-sixth sts. Bituminous concrete contract for work on Bernard st. has been awarded to P. Flanigan & Sons.

at \$7,808.50, and one for paving Twenty-seventh st., from Huntingdon to Cecil aves., with vitrified brick, to Thomas Mullan at \$7,649.

Cumberland, Md.—Six streets will be paved and two curbed when order introduced by Mr. Hirsch and passed by Council is fulfilled. Awards are as follows: Franklin st., between Cumberland and Magruder sts., paved and otherwise improved, Modern Concrete & Construction Co., \$1,843.70. Schley st., between Cumberland and Magruder sts., paved and otherwise improved, Modern Concrete Construction Co., \$2,244.56. Magruder st., between North Lee st. and Juniper alley, paved and otherwise improved, Modern Concrete Co., \$3,398.66. Wallace st. between Magruder and North Lee sts., paved and otherwise improved, Modern Concrete Construction Co., \$1,606.49. South Lee st., between Flat and Beall sts., paved and otherwise improved, Frederick Perry, \$1,086.90. South Lee st., between Paca and Green sts., paved and otherwise improved, Frederick Perry, \$1,861.70. Oldtown road, between Maryland ave. and B. & O. R. R., curbed on both sides, Frederick Perry, \$1,153.05. Wineow st., between Williams st. and subway, curbed on the easterly side, Lewis Lebeck, \$1,075.89. Thomas st., Oldtown road and Second street, paved and otherwise improved by the city.

Cambridge, Mass.—By Commissioners of Middlesex County, contract for constructing two miles of gravel road between Chelmsford and Westford to Antonio Pallotto, Lowell, Mass., at \$5,768. Other bidders were: Thomas Bruno, \$7,569; W. H. Whittaker, \$5,889; H. Michelini, \$6,246; H. W. Tarbell, \$6,810; F. H. Kendall is County Engr.

Bay City, Mich.—By Bay County Bridge Commission contracts for construction of new sidewalk in north side of west approach to Third st. bridge to Standard Engineering Co., of Chicago. Contract calls for construction of 700 ft. of sidewalk at cost of \$3,780.

Grosse Point, Mich.—For paving with creosote block Jefferson ave., by Village Council to Asphalt Block Co., of Toledo, O., at \$47,286.

South Haven, Mich.—For paving in Monroe Park by City Council to Marsman & Green of Grand Rapids at \$10,995.

Bemidji, Minn.—For paving with concrete 6 blocks by City Council to Goodman & Loitved, of Bemidji, at \$1.05 per sq. yd.

Roseau, Minn.—Contract for construction of road 1 6-10 miles long, in northwest corner of town of Poplar Grove, on town line between Huss and Poplar Grove, was let to Louis Norquist and G. H. Mattson for sum a little less than \$2,000.

Forest, Miss.—To Sutherland Construction Co., contract for building five miles of gravel road, at \$18,807.95.

Sandwich, Miss.—For construction of 7,900 lin. ft. of state road to Lane Quarry Co., at \$9,602. Other bids were: H. L. Thomas, Middleboro, \$10,765; Antony Williams & Co., \$11,052.

Winona, Miss.—By Road Commissioners of Montgomery county to Beadles & Morrison Bros., at \$40,000, for construction of approximately 70 miles of sand-clay road.

Falls City, Neb.—For paving Districts 4, 5, 6 and 7 by City Council to James Parks, of South Omaha.

Bloomfield, N. J.—For laying a curb in Olive st., to Cestone Construction Co. at cost of \$1,172. To same concern went award for placing concrete sidewalk in West st. at cost of \$475.30.

Bloomsbury, N. J.—By Hunterdon County Board of Freeholders, contract to M. Irving Demarest to construct macadam road from Bloomsbury to West Portal, 3 1/2 miles, at \$38,342.83.

Hackensack, N. J.—By Board of Chosen Freeholders of Bergen County contract for resurfacing Franklin Turnpike between Ramsey and Mahwah to George M. Brewster at \$29,368. Other bidders were: Ernest Abrahams, \$30,016 and E. C. Humphrey, \$30,157. M. J. Ford is Chn. of Rd. Comr.

Kenilworth, N. J.—Council has awarded sidewalk contracts to Harry Shallcross, of this place, for 6,000 sq. ft. of cement sidewalk at 12 cts. a sq. ft., and 2,700 cu. yds. of dirt to be excavated at 35 cts. per cu. yd. Other bidders were: John C. O'Neill, sidewalks at 14 1/2 cts. and excavating at 30 cts.; Anthony Grippo, sidewalks 13 1/2 cts. and excavating at 48 cts.; John A. Bock, sidewalks 15 cts. and excavating 30 cts., and H. O. Lonsbury, sidewalks 15 cts.; no bid on excavating.

Saddle River, N. J.—By Board of Chosen Freeholders contract for improving 2.87 miles of Market St. rd., to George M. Brewster at \$72,015.

Trenton, N. J.—By City Commission for paving various streets and alleys, about 31,000 sq. yds., to Chas. Reid & Co., 231 Highland ave., Trenton, N. J., at \$12,977; the Newton Paving Co., at \$33,341, and the McGovern Contracting Co., at \$12,142. Frank Thompson is City Clerk.

Trenton, N. J.—To Ginder Construction Co. contract for paving west side of South Broad st., from Greenwald ave. to canal.

Trenton, N. J.—Contracts representing new paving that will cost \$60,000 have been awarded as follows: Asbury st., from Ferry st. to Steamboat st., bituminous concrete, the Newton Paving Company, \$162 sq. yd., \$2,978.55; Hill's Alley, from Federal st. to Cass st., monolithic concrete, Russell Knockner, \$1.11 sq. yd.; \$1,993.90; Howell's Alley, from Lafayette st. to Front st., monolithic concrete, Charles A. Reid & Co., \$1.09 sq. yd.; \$381.95; Peace st., from West Front st. to Lafayette st., vitrified brick, Charles A. Reid & Co., for Jamestown brick, \$2.01 sq. yd.; \$934.35; Quarry st., from Green's pl. to Willow st., monolithic concrete, Charles A. Reid & Co., \$1.07 sq. yd.; \$2,744.25; Sherman ave., from North Clinton ave. to Cortland st., vitrified brick, Charles A. Reid & Co., for Jamestown brick, \$1.96 sq. yd.; \$8,916.20; Ashmore ave., from Cummings av. to Anderson st., bituminous concrete, Newton Paving Company, \$1.69 sq. yd., for Bermudez asphalt; \$5,426.85; Atterbury ave., from West State st. to Riverside ave., bituminous concrete, McGovern Contracting Company, \$1.80 sq. yd., for Bermudez asphalt; \$5,287.42; Division st., from Roebling ave. to South Broad st., sheet asphalt, Newton Paving Company, \$1.75 sq. yd., for Bermudez asphalt; \$15,833; Evans ave., from Princeton to Brunswick aves., bituminous concrete, Newton Paving Company, \$1.69 sq. yd., for Bermudez asphalt; \$7,322.80; Hermitage ave., from Cumberland st. to the Waterpower, sheet asphalt, Newton Paving Company, \$1.75 sq. yd., for Bermudez asphalt; \$1,780.25; Riverside ave., from Hermitage ave. to Delawareview ave., bituminous concrete, McGovern Contracting Company, \$1.80 sq. yd., for Bermudez concrete; \$6,854.50.

Albany, N. Y.—For paving, by Bd. Contract and Supply as follows: New Scotland ave., with sheet asphalt and concrete sidewalks, Broadway, between the tracks and 2 ft. outside tracks to be dressed granite on concrete, rest of street to be sheet asphalt and sidewalks concrete to the North Hudson Contr. Co., of Troy, at \$104,936 and \$36,032, respectively, and Alden st., to B. F. Mulderry, at \$9,727.

Binghamton, N. Y.—For paving of Ferry St. Bridge by Bd. of Contract and Supply to A. L. Wiley, of Binghamton, at \$2.45 per sq. yd. for wood block.

Lockport, N. Y.—Bids for paving Lock st. with brick from the Pine st. bridge to northerly end of the street have been opened by common council and contract awarded to C. N. Stainthorpe & Co. of this city at its proposal of \$21,485.

Rochester, N. Y.—By Board of Contract and Supply contracts for paving and for cement sidewalks. Contract for Weaver st. brick pavement went to Thomas Holahan for \$4,319.50, this being largest contract awarded. Contract for East ave. sidewalks was awarded to Whitmore, Rauber & Vicinus for \$4,080, and that for Rugraff st. walks to Crouch Bros. for \$58.40. For asphalt pavement work at Grape and Jay sts. the contract went to the Rochester Vulcanite Paving Co., for \$797.50. The New York State Railways is to pave between tracks.

Altoona, Pa.—By Board of Public Works contract for paving approaches to new Seventh st. bridge to Bell-Bockel Stone Co., at \$11,582.

Ashland, O.—For brick paving to D. A. Phillips, Ashland, at \$17,167 for 8,900 sq. yds. brick on E. Main st., and \$4,203 for 2,366 sq. yds. on E. Washington st.

Cincinnati, O.—By Bd. of Pub. Service for grading, curbing and paving with brick Highpoint ave., from Wardell ave. to its northern terminus, to Evan Evans, 1226 Ida st., Cincinnati, at \$6,595.

Cincinnati, O.—Contract for repair and improvement of Mill road, from Hamilton pike to Butler county line, has been awarded to O. D. Curry, at his bid of \$22,093. Estimated cost was \$24,242.

Columbus, O.—By State Highway Department for grading and paving with brick for medium traffic the Athens Co. State Highway F, Pet. 655 Athens-Logan road, Inter-County No. 155 in Athens Township. Length, 9,978 ft., or 1.89 miles. Wilson & Bowers, Athens, Ohio, contract price, \$25,200.00; for grading and paving with waterbound macadam and concrete the Champaign Co. State Highway F, Pet. 738, Piqua-Urbana Extension No. 1 road, Inter-County No. 188 in Urbana Township. Length 3,125 ft., or .60 miles. Wilson Engr. & Cont. Co., Xenia, Ohio. Contract price, \$7,398; for grading and paving with waterbound macadam the Champaign Co. State Highway E, Pet. 721, Urbana-West Jefferson road, Inter-County No. 188 in Union Township. Length, 5,280 ft., or 1.00 miles. Samuel W. Wrightsels, Logan, Ohio. Contract price, \$8,959.80. James R. Marker, State Highway Commissioner.

Columbus, O.—By State Highway Department, to Wilson Engineering & Construction Co., of Xenia, contract for building a section of the Piqua-Urbana state extension No. 1, in Champaign County, for \$7,398. The road is to be water-bound macadam. Wilson & Bowers, of Athens, will construct section of brick road on the Athens-Logan road. The contract price is \$25,200. A section of the Urbana-West Jefferson road was awarded to W. Wrightsels, of Logan, at his bid of \$8,959.80. The road is to be constructed of water-bound macadam.

Niles, O.—For paving of Lincoln ave. by Board of Control to Martin P. Connelly & Son, of Youngstown, at \$11,718.

Urbana, O.—Three of four contracts for new roads in Champaign county have been let. Samuel W. Wrightsels, of Logan, received contract for mile of road in Union Township on Urbana and West Jefferson pike. His bid was \$8,959.80. Wilson Engineering & Construction Co. of Xenia was awarded contracts for Westville section and in Urbana Township on Urbana and Westville pike. Bids were same, \$7,545, for both contracts.

Youngstown, O.—For paving as follows: Emma st., to Patrick Mylott, \$11,875; Lansing ave., to A. Serafino, \$8,664.

Eddystone, Pa.—By Eddystone Borough Council, contracts for paving of roadways, to Westrumite Paving Co. Surface of Saville ave., from Second st. to Ninth st., on Saville ave., will be laid with Westrumite, a smooth surface material at \$1.79 per sq. yd. Mack block will be used on Ninth st., from Ridley River to Saville ave., and on Saville ave., from Ninth st. to Chester pike, at rate of \$2.52 per sq. yd. This bid was lower than bids submitted.

Erie, Pa.—In matter of pavement of French st., 18th to 19th, lowest bidder was firm of J. M. Doyle, asking \$1.73 for asphalt and \$1.85 a yard for brick pavement. Artificial curb was bid at 40 cts. and laying pipe at \$1 a foot. Other bids were from Mayer Bros. Construction Co. at \$1.75 for asphalt and \$1 for Bessemer block.

St. Clair, Pa.—By Borough Council, contract to Ott Bros. Co. at \$11,971 for grading, curbing and paving portion of Ormsby ave.

Alexandria, Va.—By street committee, contract with Washington Asphalt Tile Co. for laying square of asphalt block on Cameron, between St. Asaph and Pitt sts.

Norfolk, Va.—To L. Lawson, contract for paving Bank st., between City Hall ave. and Main st., with smooth material, by the Board of Control. Total cost of improvement will be \$5,572.50.

Portsmouth, Va.—Street Committee has reported having advertised for bids for placing of granolithic sidewalks in several portions of city and recommended that contract be awarded to A. F. Flynn, his bid being 98 cents per sq. yd. Only one other bid was received, J. E. Hanrahan & Co. offering to do work for \$1.15 per sq. yd.

Antigo, Wis.—To L. P. Tradwell contract to pave Superior st., from 4th ave. to 5th ave., and 5th ave., from Superior st. to Field st., at \$11,897.

SEWERAGE

Los Angeles, Cal.—Election will be held on June 16 at Hermosa Beach for voting on appropriation of \$36,000 for a sewer system.

San Jose, Cal.—Clerk has been instructed to advertise for bids for sewer construction as follows: Keyes, between Second and Third; Keyes, between Fifth and Eighth; Sixth, between Keyes and Humboldt; Seventh, between

Keyes and Humboldt; Fifteenth, between Mission and Vestal.

Willimantic, Conn.—City is going to expend over \$5,000 to extend sewer through Mansfield ave. Estimated cost is \$5,464.40, and bids are to be called for shortly.

Newark, Del.—Citizens have voted to construct sewer system and disposal plant at cost of \$51,000. Engineer is T. Chalkley Hatton, of Wilmington.

Portland, Ind.—City Engineer O. O. Clayton is preparing plans for sewer construction, to cost about \$8,000.

Fort Dodge, Ia.—Nearly three miles of sewers, both storm and sanitary, either have been ordered or will be soon by City Council. Two resolutions of necessity have been adopted and contracts for two districts have been made. One district in which storm sewer will be constructed runs from First ave. south and 21st st. south on 21st to 7th ave. south. District No. 2 included in same resolution is for sewer on First ave. north and 21st st. north on street to Second ave. north, thence to 22nd st. Another resolution calls for sanitary sewer beginning at Fifth ave. south and 19th st., east on avenue to 22d st. and also beginning on Fifth ave. south and 20th st. south to Sixth ave. south, and also one block of sewer from Fifth to Sixth ave. on 21st st.

Woodbine, Ia.—Owing to technicality Woodbine will hold second election on issuance of bonds for sewerage and improvements of water plant. Special election will take place July 7, at which time issuance of bonds for \$20,000 for sewerage and \$8,000 in bonds for improvements of water plant will be considered.

Lafayette, La.—Plans are being prepared for sewer system estimated to cost \$100,000. C. D. Bourdeaux is Chn. Sewerage Comm.

New Iberia, La.—Sewerage Commission is considering various plans that have been submitted for construction of sewer system, estimated to cost about \$75,000. J. S. Pow is Mayor.

Malden, Mass.—Bids will be received shortly by City Clerk for sewers, to cost \$12,000. H. W. Estey is City Engr.

Poplar Bluff, Mo.—City Council has ordered city engineer to estimate cost of extensive sewer system for southwestern section of city.

St. Joseph, Mo.—Bids for public work amounting to many thousands of dollars will be advertised by Board of Public Works. Eighteen jobs, including construction of sewers and paving and grading of streets, are on the list.

Trenton, Mo.—Tentative plans have been prepared by City Engineer for construction of sewers in Sewer District No. 9. Estimated cost, \$20,000.

Helena, Mont.—Plans are being made to expend \$363,680 on sewers, streets and water works system.

Montclair, N. J.—Proposed ordinance has been introduced in Montclair Council for construction of sewage disposal plant in accordance with plans and specifications drawn by Rudolph Hering and Julian R. Gregory, engineers, now on file with Town Clerk Harry Trippett, of Montclair.

Bill provides that expense for use of proposed plant, trunk and lateral sewers to convey the town's sewage to the works, and conduit to carry the effluent from plant to the Passaic River, be shared by Orange and East Orange.

Trenton, N. J.—Ordinances have been passed authorizing construction of various sewers. Frank Thompson is City Clerk.

Binghamton, N. Y.—Ordinances have been adopted for construction of sewers in various streets.

Herkimer, N. Y.—Appropriation has been voted for extension of sewerage system.

White Plains, N. Y.—Bids will be received by the Board of Trustees of the Village of White Plains, N. Y., at the corporation rooms, Grand st., until June 24, 1913, at 8 o'clock p. m., for purchase of issue of sewer bonds of Village of White Plains, amounting to \$3,570. G. K. Cox, Village Clerk.

Canal Dover, O.—City Council has decided to construct sewage disposal plant, to cost about \$60,000.

Lima, O.—Bids will shortly be asked for building 1,200 lin. ft. of sewer (15 and 12-in.). J. R. Morris is Director of Public Service and will receive the bids.

Erie, Pa.—Ordinances have been passed authorizing bond issue for construction of various sewers.

Seranton, Pa.—Ordinances have been passed providing for construction of lateral sewer in 13th ave., from Luzerne st. to Fellows st. Ellsworth Kelly is City Clk.

Woonsocket, R. I.—Ordinance providing for construction of sewers in Park ave., from Willow st. to Carrington ave. has been passed.

Columbia, S. C.—City has annexed three thickly populated suburbs. Extensive sewerage and water facilities will be necessary to meet requirements of new territory.

Lancaster, S. C.—Election may shortly be called for voting on bond issue of \$45,000 for construction of sewer system.

Galax, Va.—Election will probably be held for voting on bond issue for sewerage and water system.

Richmond, Va.—Administrative Board has forwarded to Board of Aldermen resolution appropriating \$27,541.53 for construction of sewer on 14th st., between Maury and McDonough sts., South Richmond. Plan is to construct on this street trunk sewer to connect with trunk system now under construction in that part of city.

Burlington, Wis.—Petition to have sewer system extended on West st., between Edward and Chandler, has been referred to committee for action.

Victoria, B. C.—City Council is considering construction of \$500,000 sewer.

CONTRACTS AWARDED.

New Haven, Conn.—Contract to construct sewer in North Front st. to Dwyer & Mannix, New Haven, Conn., at \$15,956. Other bids were: Thomas F. Maher, \$18,371; Lawrence O'Brien, \$21,953.

Stamford, Conn.—For extension of sewer in Seaside ave., to Pellegrino Bros., New York, at \$74,000.

Atlanta, Ga.—By city for construction of lateral sewers, group 6, to B. F. Meeks at following bid: 80,000 brick at \$14; 10 cu. yds. rubble masonry, \$3; 10 cu. ft. cut stone, \$1.75; 15 sq. ft. cut flagging, 80 cts.; 1,500 ft. B.M. lumber, \$15; 13,000 cu. yds. excavation, back filling 10 ft., 48 cts.; 2,500 cu. yds. excavation, back filling 15 ft., 60 cts.; 600 cu. yds. excavation and back filling, 20 ft., 80 cts.; 200 cu. yds. excavation and back filling, 25 ft., \$1; 200 cu. yds. solid rock excavation, \$2.50; 800 cu. yds. semi-decomposed rock excavation, 75 cts.; 10 cu. yds. plain concrete, \$4.50; 40,000 ft. 6 & 8-in. vitrified pipe laying, 3 cts.; 2,500 ft. 10 & 12-in. vitrified pipe laying, 3½ cts.; 1,000 ft. 15 & 18-in. vitrified pipe laying, 5 cts.; 100 ft. 20 & 22-in. vitrified pipe laying, 6 cts.; 100 ft. 24-in. vitrified pipe laying, 8 cts.; 10 cu. yds. broken stone, \$2.50; total, \$12,143.50. Also to same firm for lateral sewer, group 7, at following bid: 100,000 brick, \$14; 10 cu. yds. rubble masonry, \$3; 10 cu. ft. cut stone, \$1.75; 15 sq. ft. cut flagging, 80 cts.; 2,000 ft. B.M. lumber, \$15; 15,000 cu. yds. excavation & back filling, 10 ft., 48 cts.; 3,000 cu. yds. excavation and back filling, 15 ft., 60 cts.; 800 cu. yds. excavation and back filling, 20 ft., 82 cts.; 200 cu. yds. excavation and back filling, 25 ft., \$1; 200 cu. ft. solid rock excavation, \$2.50; 1,000 cu. yds. semi-decomposed rock excavation, 75 cts.; 10 cu. yds. plain concrete, \$4.50; 41,000 ft. 6 & 8-in. vitrified pipe laying, 3 cts.; 3,000 ft. 10 & 12-in. vitrified pipe laying, 3½ cts.; 1,000 ft. 15 & 18-in. vitrified pipe laying, 5 cts.; 100 ft. 20 & 22-in. vitrified pipe laying, 6 cts.; 100 ft. 24-in. vitrified pipe laying, 8 cts.; 10 cu. yds. broken stone, \$2.50; total, \$14,064.50.

Herrin, Ill.—For constructing sewer system and disposal plant to Foulkes Constr. Co., of Terre Haute, Ind., at \$49,987, to include 70,600 lin. ft. 15, 12, 10 and 8-in. sewer, 153 manholes, 35 flush tanks and 5 lampholes, with sewage plant and 3 Cameron septic tanks. R. L. Adams is City Engr.

Danville, Ind.—For constructing sewers and disposal plant to Perry McKinsey, of Frankfort. Cly. R. Humston is City Clk.

Chariton, Ia.—Construction of storm and sanitary sewers to H. J. Cathroe & Co., Omaha, Neb., at \$16,049. Other bids were: C. W. Ramsey, Excelsior Springs, Mo., \$19,810; Lytle Construction Co., Sioux City, Ia., \$20,675; Brogan & Pitz, Green Bay, Wis., \$18,698; Briggs & Cory, Shenandoah, Ia., \$19,044. F. W. Trost is City Engr.

Hyattsville, Md.—Contract for constructing sewers in Maryland, Carroll and Arundel ave. has been awarded to J. Frank Rushe, his price being \$1,886.62.

Boston, Mass.—For constructing pipe sewers and drains in Pinehurst area, Hyde Park, by City Public Works Department to Peter W. Hill, of Boston, at \$35,620.

Thief River Falls, Minn.—For construction of two systems of sewers by City Council, as follows: Contract 1,

Fraser & Danforth, St. Paul, at \$14,433; Contract 2, to T. E. Webster, St. Paul, at \$21,879.

St. Louis, Mo.—For construction of sewers in Rock Creek Sewer District No. 2 to William F. Riley, St. Louis, at \$144,284.

Bloomfield, N. J.—To Bernard Recinello, contracts for construction of several sanitary sewers. Contractor agreed to lay Elm st. sewer for \$127.40; Oak st., \$166.60; Church st., \$259, and Beach st., \$698.70.

Paterson, N. J.—Contracts have been awarded by Board as follows: Water st., from Hudson to Piercy, Marco De Caprio, \$315.75; Dixon ave., from Nagle st. to Falls rd., Frank Puglia, \$753.05; Nagle st., from Webster ave. to Glover ave., Frank Puglia, \$614.75; Wall ave., from 14th ave. to 15th ave., F. P. Murray, \$412.70; Ryerson ave., Crosby ave. to Hill st., and through Hill st. to Preakness ave., Frank Puglia, \$675.15; Chestnut st., from Cedar to Oak st., Marco De Caprio, \$252.90; East 17th st., from 5th ave. to 6th ave., Frank Puglia, \$675.15; Chestnut, from Dixon ave. to Falls rd., Frank Puglia, \$764; Buffalo ave., from Railway ave. to Potomac ave., Frank Puglia, \$1,675.70; Carlisle ave., from Falls rd. to lot No. 144, Frank Puglia, \$1,493.80; Dixon ave., from Barnes to Nagle, Frank Puglia, \$1,537.45; Caldwell ave., Rockland ave. and Dixon ave., from Turner to Ramsey st., Frank Puglia, \$2,045.15.

Perth Amboy, N. J.—For constructing sewers in Bradhead pl. to Lille & Pfeiffer. Following were bids received: Liddle & Pfeiffer, 15-in. pipe per lin. ft., \$1.24; manholes, each \$4. Carl F. Poulson, 15-in. pipe, per lin. ft., \$1.75; manholes, each \$33. P. J. Monaghan, 15-in. pipe, per lin. ft., \$1.35; manholes, each, \$35. Christian Petersen, 15-in. pipe, per lin. ft., \$1.25; manholes, each \$37.

Trenton, N. J.—To McGovern Construction Co. contract for construction of Maple ave. sewer, and contract for building of sewer No. 574, in Ashmore ave., has been awarded to Antonio Di Lucia, the lowest bidder.

Trenton, N. J.—Frank J. Clark, the lowest bidder, has been awarded contract for construction of sewer in Ashmore ave.

Oneonta, N. Y.—To Kellam and Shafer Company of Schenectady, contract for trunk sewer here, that firm being lowest bidder of four competing firms. Others were Ingals Stone Company of Binghamton, Scoville and Fields of Sidney, and Dessretti and Company of Binghamton.

Schenectady, N. Y.—Contract for building of first section of the big intercepting water front sewer has been awarded to Charles Ipolitto of East Orange, N. J. There were three bids, as follows: Brown & Lowe of this city, \$88,661.50; Charles Ipolitto of East Orange, N. J., \$79,207; Union Paving Company of this city, \$113,282.

Youngstown, O.—Contract for Wilson avenue sewer, which was originally awarded Faunce and McCarthy, at \$36,000, has been assigned William Keebecker, of Haselton, and Louis Young, of Mineral Ridge, at same figure.

Erie, Pa.—To Celements Wolfran for a 9-in. sewer in German st., from 19th st. south. His price was \$1.14 a ft. on main sewer and 50 cts. a ft. on 6-in. connections, with \$1.25 for the Y & T joints and \$40 for manholes. Edward Driscoll bid \$1.45 a ft. and Joseph McCormick & Bro., \$1.35.

Evansville, Wis.—For constructing storm and sanitary sewers by City Council, to Chas. E. Hughes, of Rockford, Ill., at \$7,889.

Superior, Wis.—Contract for construction of sewer in 28th st., from Tower ave. east to John ave., thence south to the alley, has been awarded to Riches & Anderson by Board of Public Works. Bid of firm was \$783.

Superior, Wis.—By Board of Public Works, to Russell Construction Co., contract for construction of lateral sewers to be laid in district south of Normal school. Their bid was \$4,550.50.

Regina, Sask.—For sewers, as follows: First section, R. J. Lecky & Co., \$18,016; second section, R. J. Lecky, \$18,172; third section, H. G. McVean, \$34,050, and fourth section, also to H. G. McVean, \$40,000; fifth section, John Brodt, \$33,518; sixth section, Sykes Co., of Neepawa, \$34,552.

Welland, Ont.—By Town Clk., contract for constructing sewers in N. and W. Main sts., Lock and Ross sts., to Lois Sacco, of Niagara Falls.

WATER SUPPLY

Antioch, Cal.—Citizens have decided in favor of water works improvements.

Porterville, Cal.—City Council is said to be considering construction of auxiliary water system.

Sacramento, Cal.—On motion of Commissioner Wilder it was resolved by City Commission to accept specifications for pumping engine for city waterworks as prepared by City Engineer Givan. Proposed engine will have capacity of from ten to fourteen million gallons of water daily, and will cost from \$6,000 to \$12,000, according to type adopted. It may be operated by gas, steam turbine or electric power.

San Francisco, Cal.—Finance Committee of Supervisors has agreed that bids for cast-iron water pipe, not exceeding \$75,000, shall be received by Board of Public Works, this pipe to be laid in outlying districts as part of Hetch-Hetchy distributing system.

Washington, D. C.—Council has authorized construction of 600 ft. of 4-in. water main and two fire hydrants on Willow ave., 300 ft. of 4-in. water main and fire hydrants necessary on Spruce st., and 1,000 ft. of water main on Hancock ave. and fire hydrants necessary, under supervision of superintendent of streets.

Jefferson, Ga.—Installation of water works system is contemplated.

Lostant, Ill.—Town has retained Edward Byrne, Consult. Engr., La Salle, Ill., to prepare plans for water system. Estimated cost, \$12,000.

Utica, Ill.—Bids will shortly be required for constructing water system, estimated to cost \$16,000. Edward Byrne, La Salle, Ill., is Consult. Engr.

Indianapolis, Ind.—Board of Public Works has ordered Indianapolis Water Co. to lay water mains in Wallace st., from Michigan to Tenth st.; in Dearborn st., from North to Tenth st.; in Drapier st., from Minnesota to Gemmer st., and in Gemmer st., from Drapier st. to point 330 ft. east.

Garvin, Ia.—Bond issue has been voted for water works system.

Stanwood, Ia.—Installation of water works system is being discussed.

Woodbine, Ia.—Special election will be held July 7 for voting on bonds for improvements of water plant.

Flemingsburg, Ky.—Town Council is considering installation of water system. H. A. Hackley is Town Clk.

Boston, Mass.—Council has authorized sale of Fisher Hill reservoir and water system to metropolitan water and sewerage board for \$150,000.

Uxbridge, Mass.—Extension of water works from junction of Hartford ave. and Brick st. has been authorized.

Ahmeek, Mich.—Village Council is considering installation of water system, estimated to cost \$9,000. Supply will be obtained from spring on property of Ahmeek Mining Co.

Olivet, Mich.—Election may shortly be held to vote on constructing municipal water works.

Crookston, Minn.—City Council is considering \$30,000 bond issue for installation for water works and electric light plant.

Deadwood, Minn.—Installation of a 50,000 gal. tower and tank is being considered. Engineers are Oscar Claussen Engineering Co., of St. Paul.

Mora, Minn.—Special election will be held on June 17 for voting of bond issue for installation of water works.

Jackson, Miss.—Bond issue of \$250,000 has been voted, of which \$100,000 is for erection of filtration plant.

Pass Christian, Miss.—Harrison County Board of Supervisors is advertising for bids for sinking of artesian well on Courthouse grounds at Gulfport and for construction of drawbridge across Tchoulaibouffa River. Board has authorized good road commissioners of District Three to advertise for bids for construction of Pass Dehise road, including long trestle across Bayou Portage with draw of 140 feet.

Pass Christian, Miss.—City Council of Pass Christian is inviting bids for laying of a 4-inch main along Front st., from Market to Davis ave., with 3-inch fire plugs at every 200 feet.

Helena, Mont.—Plans are being made to expend \$363,680 on waterworks, street and sewer systems.

Valley, Mont.—It is proposed to construct municipal water works at cost of about \$50,000. H. J. Saunders is City Engr.

St. Joseph, Mo.—Ordinance has been ordered prepared providing for 1,000 feet of water main in King Hill, from present terminus south.

Washington, N. C.—Plans will be drawn by Engineer White for installation of water works system to cost about \$125,000.

Lima, O.—Bids will soon be asked for laying complete, the city furnishing the material, 14,830 lin. ft. of 20-in. cast iron water main. Also for building 1,200 lin. ft. of sewer (15 and 12 in.). Mr. J. R. Morris is Director of Public Service and will receive the bids.

Barnesboro, Pa.—Barnesboro Council has passed finally desire ordinance, and ordinance authorizing special election to vote on \$35,000 bond issue to provide funds for erection of municipal water plant: Special election will be held July 28.

Central Falls, R. I.—Resolution appropriating sum of \$28,000 for purpose of improving filter beds at West Side has passed both branches of the City Council and has also been signed by Mayor.

Columbia, S. C.—City has just annexed three thickly populated suburbs. Extensive water and sewerage facilities will be necessary to meet requirements of new territory. It is estimated that over \$100,000 will be necessary to install municipal conveniences. Additions at water plant will probably include additions to filter and pumping stations.

Spur, Tex.—Election on proposition to issue \$25,000 water works bonds has been carried.

Galax, Va.—City fathers have passed ordinance to issue bonds for certain amount to help defray expenses of water and sewerage system for town of Galax, and Judge Campbell will be asked to call election.

Olympia, Wash.—If voters of city of Olympia approve, July 21, an ordinance passed by City Council, a municipal water system will be established. Ordinance as passed calls for issuance of \$150,000 in bonds, and system which it is proposed to establish will supply city with 2,500,000 gallons of water daily if needed.

CONTRACTS AWARDED.

Quincy, Ill.—Aldermen have recommended that directors of Citizens' Water Co. accept bid of New York Continental Filtration Co. for construction of new filtering plant. Successful bid was \$101,000.

Corbin, Ky.—Contract to construct municipal well water system to American Light & Water Co., Chicago, Ill., at \$26,794.

Elizabethtown Ky.—For constructing reservoir to Murphy Bros., of Bowling Green.

Chisholm, Minn.—For furnishing pump of 800 gallons per minute capacity, to Fairbanks Morse Co., through Geo. P. Baxter, of Duluth, Minn., at \$1,219.50.

Morgan, Minn.—For constructing water works to W. D. Lovell, of Minneapolis, at \$12,290.

Mountain Iron, Minn.—By Council to Boylan Co., of Virginia, contract for water mains, storm sewers and a sanitary sewer. Value of work is \$12,000.

Pine City, Minn.—For Downie double stroke deep well pumping outfit and equipment, to Keystone Driller Co., Monadnock Block, Chicago.

Taylor's Falls, Minn.—For constructing water system to Pastoret-Lawrence Co., Duluth, Minn., at \$6,588.

Cut Bank, Mont.—For constructing waterworks and electric light plant, to Two Miracle Concrete Corp., of Kansas City, Mo., at \$41,000. Other bidders: Haggard Constr. Co., Fargo, N. D., \$75,000; J. V. Lovell Co., Minneapolis, Minn., \$51,000.

Huntley, Mont.—By U. S. Reclamation Service to E. Lindstrom, of Billings, for construction of about 41,000 ft. of tile and drains in connection with the Huntley irrigation project at \$38,521.

Peru, Neb.—To Inter Mountain Bridge & Construction Co., of Tecumseh, for construction of water works system at \$18,784.84.

Peru, Neb.—For construction of water works, from plans of C. F. Sturtevant of Holdrege, to Intermountain Construction Co., of Tecumseh, at about \$18,780.

Cincinnati, O.—For cleaning water mains to National Water Main Cleaning Co., New York City at \$9,825. Other bids as follows: American Water Main Cleaning & Construction Co., Louisville, Ky., \$10,924; Beaver Engineering & Construction Co., New York City, \$10,443.

Dunnville, Ont.—For laying 10,000 ft. water mains to W. H. Cookman, of Niagara Falls, N. Y. Robt. G. Kyd is Supt. Water Works.

LIGHTING AND POWER

Bluffton, Ind.—Public utility commission has authorized issuance of \$20,000 worth of bonds by city of Bluffton to defray expenses of buying an engine, two new boilers and other appliances and apparatus for its municipal electrical plant. Total cost of improvement is to be \$25,223, city to pay difference between that and bond issue in cash.

Indianapolis, Ind.—Public Utility Commission has authorized issuance of \$20,000 worth of bonds by city of Bluffton to defray expenses of buying an engine, two new boilers and other appliances and apparatus for its municipal electrical plant. The cost of improvements is to be \$25,223.

Cedar Falls, Ia.—George M. Bechtel of Davenport has been awarded \$50,000 bonds for municipal lighting plant.

Lawler, Ia.—Election will shortly be held on question of constructing municipal electric light plant.

Russell, Ia.—It has been voted to install a municipal electric light plant.

Fort Scott, Kan.—Council has instructed Light Committee to authorize Fort Scott Gas & Electric Co., to install lighting system for Plaza at once.

Jetmore, Kan.—Citizens of Jetmore are contemplating proposition to issue \$10,000 bonds for construction of an electric light plant and water system.

Scandia, Kan.—Scandia has completed arrangements with Concordia Electric Light Co. for installation of lighting system. City Council has passed their approval on proposition which will also be taken up by citizens of Kackley in near future.

Boston, Mass.—Plans have been prepared for installation of ornamental street lighting system on Huntington Ave.

Duluth, Minn.—Commissioner Leonidas Merritt, head of division of public utilities, is being flooded with applications for installation of additional lights in all parts of city.

St. Joseph, Mo.—Repairs and improvements in city lighting plant, aggregating \$1,200, have been asked by E. Grav Powell, building inspector, and M. E. Hunter, superintendent, and matter has been presented to board of public works by J. E. Johnson, city purchasing agent.

Clayton, N. M.—City is considering installing new street-lighting system. E. E. Kirtley is Supt.

North Platte, Neb.—City is contemplating plans for installation of ornamental street lighting system. Charles McNamara is City Engr.

Islip, L. I., N. Y.—The South Shore Gas Company of Babylon, L. I., has filed with the Public Service Commission, Second District, application for approval of franchise granted by Town of Islip, and for permission under this franchise to construct and maintain gas plant within that town for purpose of producing and furnishing to its customers gas for light, heat and power.

Niagara Falls, N. Y.—The decorative illumination system for Falls st. will cost \$14,000 and will be installed at once.

Lynbrook, L. I., N. Y.—Question of installing municipal lighting system is being discussed.

Seneca Falls, N. Y.—Plans are being made for a two-mile extension of ornamental street lighting system in Seneca Falls. R. C. Smith is Supt.

Syracuse, N. Y.—Board of Contract and Supply is preparing to advertise for proposals for new city lighting contract for term of years.

Syracuse, N. Y.—In response to request from Mayor Edward Schoeneck, Ornamental Street Lighting Commission of Chamber of Commerce has filed with him revised plan, including map for extension of ornamental lighting system.

Syracuse, N. Y.—Board of Contract and Supply has directed Secretary Robert D. Roney to advertise for proposals for city lighting contract. The present contract was let for five years.

Barberton, O.—At regular Council meeting ordinance was passed authorizing issuance of bonds in sum of \$110,000 for erection and installation of municipal light plant.

Lancaster, O.—Election will shortly be held, to vote on \$125,000 bond issue for construction of electric light plant.

Norwalk, O.—Plans are being prepared by H. Whitford Jones Co., of Cleveland, for municipal electric light plant. A. W. Carpenter is Div. of Pub. Service.

Bristol, Va.—Commission has ordered placing of 65 additional street lights, at

Wood Block Pavement

Wood Paving in Minneapolis

For eleven years Minneapolis has been using wood pavements. The first ones laid in 1902 were so satisfactory that the area of wood paving was steadily extended with larger orders every year until now wood block is laid on 93 streets covering a total length of about 61 miles. During the eleven years the amount of wood block pavement laid has equaled that of all other types of paving put together.



Third Avenue, South, Minneapolis, Minn.

The cost of maintenance in Minneapolis has been very low. In 1911, for instance, it averaged less than one-tenth of a cent per square yard per year, despite the fact that some of the paving was then nearly ten years old.

Wood blocks which were laid in Third Avenue, South, were taken up after nine years, for examination and showed wear of about one-quarter of an inch.

Mr. Ellis R. Dutton, Assistant City Engineer, writes:—"There is no better paving laid or can be laid at the present time. Wood block paving is quiet, clean, dustless and more durable than any other pavement made. Its adoption is a sound investment for any city."

Booklets on Request

U. S. WOOD PRESERVING CO., 165 Broadway, NEW YORK

additional cost to city of \$33.75 per month. All street lights are to be increased from 30 candle-power each to 60 candle-power.

CONTRACTS AWARDED.

Pasadena, Cal.—By City Comrs., to B. F. Kierulff, Jr., of Los Angeles, for constructing ornamental lighting system on Los Angeles ave., at \$22,130.

Syracuse, N. Y.—Contract for constructing underground conduits for outside wiring of new city telegraph fire alarm system has been transferred to John Young.

Hinton, Okla.—For construction of electric light plant and water system to Don A. Tolbert, Ada.

Arlington, Ore.—By city for constructing electric lighting plant and pumping station as follows: For powerhouse, to H. W. Lang, Arlington, Ore., at \$1,750; for filter to Cal. Jewell Filter Co., San Francisco, Cal., at \$2,506, and for engine, generator, switchboard and pump to Fairbanks, Morse & Co., at \$5,125. L. C. Kelsey, Civil and Hydraulic Engr.

FIRE EQUIPMENT

Arbuckle, Cal.—Purchase of hook and ladder truck is strongly recommended.

Gilroy, Cal.—Purchase of chemical fire engine is being discussed.

Los Angeles, Cal.—Election will be held on June 16 at Hermosa Beach for voting an appropriation of \$10,000 for fire apparatus.

Richmond, Cal.—City is discussing installation of modern fire alarm system.

Hartford, Conn.—Purchase of about 2,000 to 4,000 ft. of fire hose is being considered.

Rome, Ga.—Purchase of one motor combination pumping engine and hose wagon has been recommended in report of Chief J. C. Harrington.

Idaho Falls, Idaho.—Purchase of motor apparatus has been recommended.

Boston, Mass.—Mayor has put up to council Fire Commissioner Cole's request for \$300,000 in two years for purchase of motor fire apparatus. Communication has been referred to committee on finance.

Menominee, Mich.—About 1,000 ft. of fire hose will shortly be purchased.

St. Paul, Minn.—Plans are being made for complete motorizing of fire department.

Elizabeth, N. J.—At recent conference of Finance Committee of City Council and Fire Board, former was offered two propositions, one to recommend immediate appropriation of \$11,500 to repair and equip Engine Company No. 3 with auto tractor and chemical wagon, and other to recommend to City Council immediate appropriation of \$9,000 to buy auto engine similar to No. 7, with agreement that within one year second appropriation would be sought to add chemical wagon to company. The last proposition has been accepted.

Perth Amboy, N. J.—A request from McClellan Engine Co. for new hose and chemical wagon has been received and referred to Committee on Fire.

Lockport, N. Y.—Purchase of motor fire engine and combination chemical is being discussed.

Manchester, N. Y.—Election will be held for voting on purchase of new apparatus.

Syracuse, N. Y.—Purchase of motor fire apparatus is being urged.

Sentinel Butte, N. D.—At mass meeting called by city council it was decided to install adequate fire protection. It has been decided that two chemical engines and hand extinguishers for all business houses be purchased by city council.

Akron, O.—Ordinance has been adopted for bond issue of \$9,000 for erection of new station.

North Homestead, Pa.—Erection of fire station is being discussed.

Austin, Tex.—About 1,000 ft. of fire hose will be purchased.

Hempstead, Tex.—Purchase of 1,000 ft. of hose is being considered.

Port Arthur, Tex.—A motor triple combination pump, chemical and hose wagon may be purchased shortly. F. J. Trost is Chief.

Milwaukee, Wis.—Purchase of three motor combination wagons, three motor trucks and one tractor is recommended; estimated cost, \$41,000.

Rawlins, Wyo.—Purchase of motor apparatus is being discussed.

CONTRACTS AWARDED.

Sacramento, Cal.—By City Commissioners, contract for furnishing forty

fire alarm boxes and four indicator gongs needed in the annexed district to Gamewell Company. Successful bidder asked \$5,900, which is at rate of \$125 a box, and \$225 for each of indicators.

San Jose, Cal.—Contract for constructing new firehouse on North Elgin st. has been awarded to Thomas Scherrebek for \$3,375. Other bids ran from \$3,569 to \$3,700.

Wilmington, Del.—To Weccacoe Fire Co., contract to Front Drive Motor Co., of Hoboken, N. J., for tractor, to be attached to steamer.

Geneva, Ill.—To Chicago Fire Hose Co. contract for furnishing this city with 500 ft. of their "Dresden" hose at 72 cts. per ft.

Anderson, Ind.—To Nyberb Automobile Co., of Anderson, for one 6-cylinder chief's car, equipped with one 35-gallon chemical tank, three hand extinguishers, 200 ft. of chemical hose.

Baltimore, Md.—By Fire Board, contract for 2,000 ft. of fabric hose of 2½ and 3-in. thickness, to Eureka Fire Hose Company, at its bid of \$1.10 and \$1.45 a ft. respectively.

Keewatin, Minn.—By city, contract to W. S. Nott Co., of Minneapolis, Minn., for one hose cart at \$75 and 500 ft. of single jacket hose at 85 cts. per ft.

Corning, N. Y.—To American-La France Fire Engine Co., for one motor pumping engine and one motor combination chemical and hose wagon, at \$14,000.

Akron, O.—Board of Control has awarded two contracts for rebuilding of three pieces of present horse-drawn fire apparatus. The pieces will be remodeled to make them motor propelled. One contract for equipping the large truck at Engine house No. 5, with a tractor, was awarded to the Couple Gear Freight Wheel Co., of Grand Rapids, Mich., at \$5,500. The contract for the rebuilding of two steam fire engines to make them motor propelled was awarded to the Front Drive Machine Co., Hoboken, N. J., at \$3,850 each.

Wilkes-Barre, Pa.—City Fathers have decided to buy \$1,400 worth of Eureka hose at rate of \$1.20 per ft. and \$400 worth of hose from Combination Rubber Manufacturing Co., of Bloomfield, N. J., at \$1 per ft. Bids were as follows: Eureka Fire Hose Co., New York—Eureka brand, \$1.20; Paragon, \$1.10; Red Cross, \$1; Trojan, 75 cts. Combination Rubber Mfg. Co., Bloomfield, N. J.—Indestructene, \$1; Combination, 85 cts.; Bloomfield, 80 cts. Fisher, Richards & Todd, Hazleton—Selected, 95 cts. New Jersey Spring Rubber Co., New Jersey—A-1, 85 cts.; Metropolitan, 75 cts. B. F. Goodrich Co., New York—White King, 80 cts. Mineralized Rubber Co., New York—Mineralized, 79 cts. Fabric Hose Co., New York—Unique, \$1.20; Keystone, \$1.10; Arrow, \$1; Deluge, 90 cts. Hudson Mechanical Rubber Co., New York—Hudson, \$1. Eastern Pennsylvania Supply Co., Wilkes-Barre—Baker Fabric \$1.20; Princeton, 95 cts. United Globe Rubber Co., Trenton, N. J.—Alpha, 79 cts.; Multiple, 90 cts. C. C. Co., Boston, Mass.—C. C. C. Underwriter, 90 cts. J. C. McAlarney, Plymouth—La France brand, \$1.08; Babcock, \$1.05; Champion, \$1; Albert, 90 cts. Bi-Lateral Fire Hose Co.—Progress, \$1; Congo, 90 cts.; Bi-Lateral, \$1.10.

BRIDGES

Redding, Cal.—Plans have been accepted by City Trustees for bridge of reinforced concrete to be built at north end of Market st. across Sacramento River. Plans call for expenditure by city of \$45,000.

Wilmington, Del.—Bonds in sum of \$100,000 for bridge improvements will be sold until 12 noon June 27. E. B. Hollingsworth, Chn. of Finance Committee.

Lafayette, Ind.—At joint meeting of County Council and Commissioners it has been decided to build bridge across Wabash River at Main st. that will cost \$250,000. It will be constructed of concrete and will be built after plans submitted to County Commissioners by Prof. W. K. Hatt, Prof. Albert Smith, of Purdue, and Everett B. Vawter, of West Lafayette. Contract is to be let July 1.

Des Moines, Ia.—City may build magnificent concrete bridge across Des Moines River at Grand ave., modeled after concrete structure at Locust and Walnut sts.

Sioux City, Ia.—Agitation has been resumed for building of free bridge over Missouri River, between Sioux City and South Sioux City. Engineer's estimate is that it would cost \$275,000.

Milville, N. J.—Board of Freeholders has passed resolution awarding bonds to be issued for construction of Main st.

bridge. Bids for bonds have been opened. There were six bids. Hannah E. Gillman was awarded \$1,000 at \$105, John Gaskill, Newport, N. J., \$8,000 at \$103, and remaining \$16,000 to R. M. Grant & Co., New York, at \$101.17. This firm wanted entire issue and if they refuse to accept \$16,000, then that amount of bonds will be awarded to Bridgeton National Bank, next highest bidder at \$100.55.

Herkimer, N. Y.—Town will hold special election to vote on \$60,000 appropriation for new concrete bridge to cross West Canada Creek, replacing washed-out span.

Cincinnati, O.—Plans and specifications and estimates for repair work have been approved, as follows: Repair of bridge on Springfield pike over Mill creek, near the Fair Grounds, estimated at \$12,000; repairs to bridge on Elliot st. over West Fork, Mill Creek, \$13,675; repairs to bridge over East Fork, Mill Creek, \$12,800; Culvert in German road, near McAvoy's place, \$1,988.

Scalp Level, Pa.—Borough Council has voted to accept George Statler's plans for concreting old iron bridge adjoining Brinham property.

Springdale, Pa.—Erection of bridge over Allegheny River, between Springdale and Parnassus is being discussed.

York, Pa.—County Commissioners will inspect sites for erection of five modern county bridges to displace township and borough structures across streams at various points in county.

Clerburne, Tex.—Bridge will soon be built across Brazos river connecting Bosque and Johnson counties, if plans of joint committee of citizens of Bosque, Hill and Johnson counties are carried out.

Fort Worth, Tex.—Bids for constructing Johnson Branch bridge have been rejected. New bids will be called for.

Janesville, Wis.—Bids for construction of bridge over Spring Brook on South Main st. will be advertised for at same time as bids for construction of the Milwaukee st. bridge.

Janesville, Wis.—Election will be held July 2 for voting on bond issue for erection of new bridge across Rock River at East and West Milwaukee sts. J. A. Fathers is Mayor.

Milwaukee, Wis.—It is expected that resolution now pending in common council, directing commissioner of public works to proceed with construction of Buffalo st. bridge, will pass council shortly, and it is planned to insert advertisements asking for bids for contract.

CONTRACTS AWARDED.

Mobile, Ala.—For concrete bridge and culvert work on Hall's Mill Road by Bd. of Road and Revenue Comrs. to J. L. Henderson, of Birmingham, at \$8,199.

Willows, Cal.—To Ross Construction Co. of Sacramento, contract for building Orland bridge over Stony Creek, at cost of \$115,000.

E. St. Louis, Ill.—To Attica Bridge & Construction Co., contract by Park Board to construct bridge over drainage canal about quarter of a mile south of State st. Cost will be \$3,075.

Marion, Ind.—County Commissioners have awarded two bridge contracts for bridges advertised. The Big Black creek bridge in Van Buren township was bid in by J. E. Mason at \$593, while the John Props bridge of Pleasant township was contracted by B. F. Hatfield at \$675.

Shelbyville, Ind.—County Commissioners have awarded contracts aggregating more than \$30,000 for replacing some of bridges and grades destroyed last March. Among important contracts were following: Geneva bridge superstructure, Central States Bridge Co., of Indianapolis, \$7,080; Morristown bridge superstructure, same company, \$7,485; Geneva bridge substructure, Raymond & Howard, \$527; Morristown bridge substructure, James A. Parrish, Greenfield, \$1,700; Brandywine bridge substructure, Gageby & Craig, Greensburg, \$4,274; Franklin grade, William Ogden, \$7,137.50, and Flatrock grade, William Avery, \$1,613.

Bangor, Me.—Contract for new approaches to Bangor and Brewer bridge has been awarded to Canton Bridge Co., of Attleboro, Mass., the lowest of six bidders. The amount was \$15,417.

Yarmouth, Mass.—To Crosby & Taylor, of Centerville, Mass., contract for constructing reinforced concrete girder bridge, Bass River, between Yarmouth and Dennis, at \$10,889. Other bidders: R. L. Whipple, Worcester, \$16,543; Rendle & Stoddard, East Boston, \$13,096; Simpson Bros., Boston, \$15,029, and Sears & Connolly, Hyannis, \$10,605.